Telephony

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MUNICIPAL TELEPHONY IN GREAT BRITAIN

By Herbert Laws Webb

THE editorial article in TELEPHONY for October, 1905, entitled "City-owned Telephones," hardly does justice to the quality of the technical work and organization of the municipal telephone business in Great Britain. In my opinion it is chiefly due to the fact that the design, equipment and organization of the municipal telephone systems have been so bad that municipal telephony has been such a hopeless failure. The class of telephone work done on the five existing systems is so opposed to all the principles of telephone working determined by long experience that, it will seem to American telephone men almost incredible that any person claiming to be a responsible telephone man should in these days advocate spending good money on such plant and equipment. Let me briefly tell the story, and let the readers of TELEPHONY judge whether in criticizing the municipal telephone work I have been prejudiced or unjust.

The five existing municipal telephone systems adorn the towns of Glasgow, Hull, Portsmouth, Brighton and Swansea. The act of parliament which enabled British municipalities to borrow money for the purpose of establishing telephone systems was passed in August, 1899. The municipality of Glasgow, which trades in almost everything, had long conducted an agitation in favor of municipal telephones and was the first to take advantage of the new act. An estimate for a municipal telephone system in Glasgow had been prepared in 1897, which purported to show that a system of 5,200 subscribers' lines could be built in Glasgow at a cost of $490,000 and operated at a profit at a universal flat rate of $26. When actual work was begun at Glasgow in 1900 this estimate and the general scheme on which it was based was adopted as the foundation for the working system. The only modification introduced was a provision of $100,000 for spare plant.

Now consider the position at Glasgow in 1900. The area to be served by the new telephone system covers 140 square miles and includes numerous small towns and suburban districts having, with Glasgow, a total population of about a million. The Glasgow Corporation is one of the richest municipalities in Britain, controlling numerous industries, and ambitious to control more. The municipal telephone department had free use of the streets, all the local influence a large trading municipality can command (which is much), a clean slate, a rich and populous territory, and had only to face a competitor handicapped by being barred out of the streets and handicapped by having to do business according to ordinary commercial methods—which in municipal trading circles are regarded as intolerable and unnecessary.

One can imagine what an American telephone man would have done under such enormously advantageous circumstances. He would have laid down a modern telephone plant, designed with due regard to the area and population, and made a foundation on which an efficient system could have been built and developed. But the manager of the Glasgow system was one who did not believe in modern, that is, in American telephone practice. In bygone days, in the period of single-wire overhead working, he had had some experience in small telephone exchanges equipped with the old Law system, with the "ring-through" system, and with the strange and devious methods belonging to the experimental period of telephony. So he provided Glasgow with telephone exchanges to be worked on the "ring-through" system and on the Law system. The "ring-through" system means that the operator does no ringing; she tells the calling subscriber when he is connected and he has to hold his hook down and ring his correspondent with the hand generator. The called subscriber generally rings back before he answers. That this is a foolish and time-wasting method and means lack of economy in a variety of directions has often been pointed out. But the promoter of the municipal systems is an authority on telephone matters; he tells the worthy aldermen and councillors that the "ring-through" system is modern and efficient, and they believe him.

If the ring-through business, especially in a system having trunk working, is pure foolishness, what are we to say of the Law system! I suppose the majority of the readers of TELEPHONY have no practical acquaintance with the archaic Law system. It was used to a small extent in a few American cities, but never really held its own even against the old series magneto system. The principle is that each subscriber has access to a service wire or call-wire, common to a group of from thirty to sixty stations, on which an operator listens continuously. There are no line or clearing-out signals and no answering jacks on the switchboard; the subscriber says his own number as well as the number he wants over the call-wire (say, "2537 on 1942") and the operator plugs up the connection in the multiple. To get disconnected the subscriber has again to go in on the call-wire and say, for example, "2537 off." The opportunities for errors, delays, and general exasperation afforded by this method of working are unlimited, while the construction difficulties incident to running two pairs of wires to every subscribers' station and, in an underground cable plant, grouping forty or fifty subscribers on a common circuit for the call-wire are not to be regarded lightly. With a small single-exchange system and a stable and well-trained group of subscribers, the call-wire system can be made to work, after a fashion. But in a large city, with an active traffic and with trunk working, it becomes ridiculous; combine it with the "ring-through" system and it becomes a farcical travesty of telephone service.

What any real telephone man could have foretold has

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come about in Glasgow. The center of the city has been provided with call-wire exchanges, equipped with horizontal switchboards, the cords hanging from canopies overhead, and the subscribers' stations equipped with magneto instruments provided with a push-button for giving access to the call-wire. In the outlying districts it became too expensive in line construction to run an extra circuit to every subscriber for the call-wire and a hybrid method—half magneto, half push-button—was adopted. For this reason; if you "ring-through" you must have a clearing-out drop which the magneto generator does not actuate, so the clearing-out drop is differentially-wound and worked off a battery, and the subscriber has to push a red button to ring off. In this way the Glasgow municipality started out with two radically different methods of working in the same system. In each case the subscriber had to go through a whole train of operations to work the service, but in each case the train was different.

Then, as the subscribers began to get a little experience of the service given by the call-wire system, they began to protest, and they protested very vigorously. The difficulty

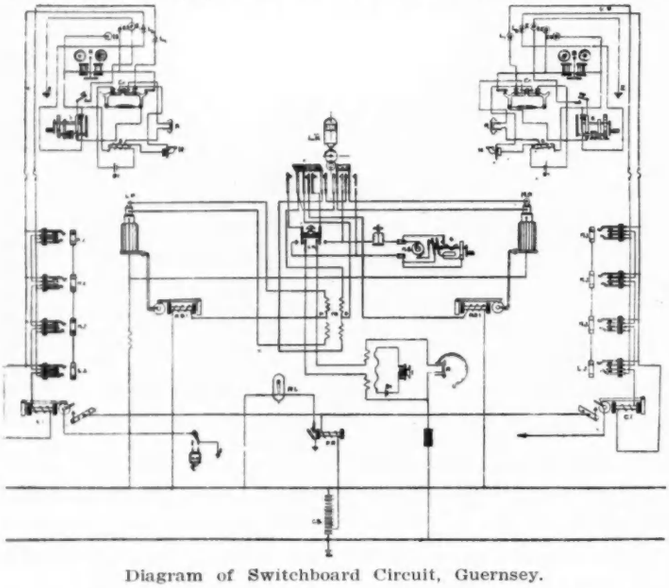


Diagram of Switchboard Circuit, Guernsey.

of getting "on" was very great, especially at the busy hour, when ten or a dozen callers might be clamoring on the call-wire at once, but the difficulty of getting "off" was prodigious. With the call-wire system the subscriber has to perform what, telephonically speaking, might be called an "unnatural act" to get disconnected; he has to remember, after finishing his conversation, to press the button again, get the attention of the operator and say "1942 off," and it is only the originating subscriber who can "call off," unless by a rare chance the two subscribers happen to be grouped on the same call wire. Imagine how often the ordinary telephone user is likely to remember or to bother himself to go through this performance when he has finished his conversation. The "hang-up" trouble became epidemic in the new service as soon as it started. In response to the angry denunciation of this brand of telephone service by the public, the municipal telephone department began to tinker with their flat switchboards and to hang on clearing-out drops, so that in some of the exchanges it is not necessary to go back on the call-wire to call off, but simply to press the button. This introduces yet a third combination of methods of working.

But even more radical a change was made when a new central office was equipped in the center of the town, in part of the district served by the main exchange. The main exchange was planned to serve 10,000 lines, but the plans went wrong, and, either because the cable plant became congested or because the exchange equipment or accommodation did not fulfill expectations, it became necessary to open another exchange nearby. This was equipped with a board having line and clearing-out signals, but operated by push-button. Thus a fourth method of working was introduced. As there are a few party lines which are worked by common battery signaling, there are in all five distinct methods of working the telephone in the Glasgow municipal system. The natural result is that the service is a by-word with the public, and that the growth of subscribers, which was rapid at first owing to the cheap rates and the glowing promises of a modern and efficient service, has almost entirely ceased.

This result is chiefly due to the superficial manner in which the municipality approached the telephone problem, to the inferior technical work and to inferior organization and management. No proper study was made of the area and population to be served, the rates were based on an estimate which was wholly delusive—which any experienced telephone man would have pronounced to be wholly delusive after a very short study of the plans and figures and of the conditions—and the business was founded on a plant of a fundamentally defective character. The switchboard and substation equipment is not by any means the only part of the plant which is not up to modern telephone standards. The cable plant is laid out for taper distribution, the cables being split up by innumerable glove joints ranging up to eight branches, and a large part of the cable plant consists of armored cable buried solid in the ground. The same authority who clings to the "ring-through" system proclaims that this sort of telephone distribution plant is thoroughly modern and efficient. The most recent statistics of the Glasgow municipal system show that out of a total of 221 miles of cable 84 miles, or nearly forty per cent, is armored cable buried solid.

Although the Glasgow municipal system is of the extraordinary description sketched above it must not be imagined that it has been a cheap system to build. The original estimate was $490,000 for 5,200 lines, roughly $94 per line. Extension stations, private branch exchanges, and party lines were not reckoned with, only figures based on the complete subscriber's line, showing the full revenue from 5,200 complete direct lines were used. The total capital invested in the system, according to the last official report, is a little short of $1,800,000, and there are 12,362 stations of all kinds, giving an average capital cost of nearly $145 per station. If the original estimate had been based on stations instead of lines the estimated average cost per station would have been about $80, so the estimate has been exceeded by nearly one hundred per cent. And for its $1,800,000 the Glasgow Corporation has a telephone system designed and laid out on fundamentally wrong lines, equipped with a heterogeneous collection of obsolete apparatus tied together by a distribution plant which is to a large extent unsound. There is no need to tell telephone men that the only cure for this sort of thing is a complete reconstruction of the plant and reorganization of the business. Some of the Glasgow town councillors are doubtless beginning to recognize this, but municipal telephony cannot be run as a telephone business pure and simple—it cannot be dissociated from municipal politics and pride. Municipal politics and pride demand that every municipal trading venture be proclaimed a success, no matter what the facts may be. The Glasgow Corporation continues to publish accounts showing by dint of careful bookkeeping a small balance to the good. To admit, when only a few thousand dollars have been put to depreciation, that it is necessary to scrap equipment standing on the books at $500,000 and to spend at least as much more on new plant, would, to put it in the vernacular, "give the whole show away." So the derelict plant is kept going as best it may be, and the Glasgow municipal telephone system is heralded by at least

a part of the world's press as a great success in municipal trading. The facts are that in every way it is the finest example of how not to do it that has been offered in the telephone business during the present century.

Glasgow is the largest of the municipal systems and conspicuously the worst from a technical point of view. The others are small and struggling; their general design is similar to the extent of using the "ring-through" system, taper distribution and armored cable buried solid for distribution purposes. At Portsmouth and Swansea the switchboards have signals and these are operated by push-buttons on the subscribers' instruments, the generator being reserved for "ring-through" manoeuvers. At Brighton and Hull a curious switchboard has been adopted which shows that however unfamiliar with real telephone working the municipal telephone men are, common battery methods have been thought worthy of imitation to a certain extent. In these systems the signals are operated automatically, not by a definite change in the circuit but by a momentary earth contact which the switch-hook makes in rising and falling. The signals are drops, and as they are merely thrown each time the switch-hook goes up or down they must be restored by the operator. The line drop is mechanically restored by the answering plug, and the clearing-out drops, one on each cord, are mechanically restored by plug-seat connecting-rods or levers. One would have thought that the absurdity of imitating the double supervisory signals of the common battery system by means of two drops which have to be restored mechanically and are worked by a fleeting earth contact would be obvious to any practical man on a moment's consideration. Not so in British municipal telephony, however; this arrangement is announced as a great improvement, especially as it is combined with the "ring-through" system. It does not matter that one clearing-out drop always falls when the called subscriber answers, so making half a disconnection signal—which becomes a whole one if the calling subscriber happens to touch the hook, or if a contact comes on the line—the operator is supposed to restore the clearing-out drop when it falls, so as to put it in readiness to fall again, and that of course takes care of that! Incidentally, on this brilliantly thought out system the subscriber has to remember to keep his telephone off the hook when he rings through—otherwise he lets go one of the hair-trigger clearing-out signals As the habit of every telephone user is to hold the hook down when ringing, it may be imagined how much trouble this gives rise to in the course of a day.

Owing to the use of drops and mechanical restoring devices a cumbersome design of switchboard results which gives an operator about a third of the load she could easily handle with modern apparatus, and gives a board from twice to three times as long as it need be for the traffic. But these are fine points which do not come within range of municipal telephone vision. Witness the latest gem of technical work in British municipal telephony—the new multiple switchboard at the main exchange in the island of Guernsey. Guernsey has a locally-owned telephone system, established in 1898. The service is supplied at very moderate message rates, and although the whole system is very frail and crude and the service merely passable, a very fair development has been worked up—some 1,400 telephones in a total population of about 40,000. Owing to the message rates, and owing to the tranquil conditions of life on this peaceful agricultural island, the traffic is very small, barely averaging two calls per line daily. A short time ago it became necessary to discard the transfer boards originally installed and to equip a multiple board. This new equipment was recently inaugurated with great ceremony and has been described in all seriousness by all but one of the five English electrical journals. To the credit of the fifth let it be said that it published recently a brief article, pointing out some of the manifest absurdities of the equipment. From the published statistics it appears that the new exchange serves some 900 subscribers' and public station lines, giving a total average daily traffic of 2,050 calls, a switchboard of ten operators' positions is employed. The principal features of this up-to-date board are mechanically-restored line drops, 100 per position, split cords—one plug of a pair on a cord shelf below the line drops and the other on a shelf above the line drops—equipped with plug-seat switches to cut out the operator when the connecting cord is lifted, and double clearing-out drops, one drop on each cord, to be operated by a push-button on the subscriber's instrument. Even with all these eccentric arrangements it is difficult to see how the operators will manage to keep awake, with an average daily load of 200 calls.

New Multiple Switchboard at Guernsey.

The double clearing-out drops merit a word to themselves. In the write-up describing the Guernsey equipment circulated among the electrical papers it is stated that a "double-sided ring-off" has been adopted "in accordance with modern telephone practice," and it is further stated that the operators are forbidden to "sever a connection" until both ring-offs "have put in an appearance." The article does not state and it takes a study of the circuit diagram to discover that the "double-sided ring-offs" are to be operated by a push-button on the subscriber's instrument. Consequently both subscribers must remember to press the button to give an effective clearing signal. And this is telephone work done in 1905, and seriously described by technical journals as being modern, up-to-date, etc.

I imagine that most American telephone men will have difficulty in believing that such ludicrous work is really done in the British municipal telephone systems. But nevertheless it is so, and not to be too prolix I have if anything understated the eccentricities of the technical features of those systems.

What will probably puzzle the American reader is—why should such work be done at all? It is difficult to answer without being more blunt than looks well in print. The basic reasons are vanity and ignorance. Municipal traders are not blessed with a great sense of responsibility nor with much acumen. The ruling desire is to spend money (other people's money), and to acquire power and influence —to control, to interfere and to manage. If a show can be made of doing something cheaper than it is done by others, be it "trams," lighting or telephones, the real facts—the real status and finances of the business—do not matter in the least, so long as a showing can be made on paper; and municipal bookkeeping is always equal to that. In taking up telephone work the few municipalities which have done so have fallen an easy prey, in their craze for cheapness as the sole requisite, to unsound technical work and shoddy methods, and, having once committed themselves, have been too obstinate to listen to any criticism or suggestion from those who understand what modern telephone work really is. If one were discoursing on municipal trading in general, one would be tempted to say that its greatest evil is its insincerity. No mistake can be admitted or corrected, no ordinary commercial law recognized, no criticism or suggestion received, once a town council has embarked on a trading scheme. In municipal telephony we see a parcel of committees composed entirely of non-technical men, in fact consisting for the most part of small tradesmen, setting themselves up as authorities in a highly technical industry, in opposition to those who have made it a life work. And those same committees have spent in the course of five years more than two and one-half millions of dollars in telephone plant and apparatus of such a type that the moment it is put in use it is not worth fifty per cent of its original cost or book value.

TELEPHONE DEVELOPMENT

By W. B. Woodbury

THE proper development of telephone properties is a subject that has not been given the fullest measure of consideration and study by those interested in Independent telephone properties. What little consideration has been given to this most important department has been more or less incidental to its existence. The problem of getting the most out of what there is to work with has been too seldom studied along logical and result-getting lines. The franchise rights have been secured, the proposed plant with its subway, pole lines and scheme of distribution has been outlined, and the property then turned over to the stockholders to operate. The plant in the hands of its owners, an effort is made to add to its list of subscribers and to make the company earn all the money possible. The means to arrive at this result, however, are too often hastily thought out and unskillfully executed. The development of a telephone property to the extent of its possibilities is a science, although too few will grant this fact. The campaign for new business and to bring the business already secured to the highest point of revenue production should be as carefully planned and as skillfully and industriously executed as any noted coup of the Wall street market. There is much at stake and the work should be trusted to someone of experience. This applies not only to the scheme and scope of development, but to the execution as well. Many a well-planned campaign has gone wrong, because its actual working out has been entrusted to incompetent hands.

The first thing necessary to bring about a satisfactory condition is to study carefully the property in question. The proposition should be looked at from every standpoint and diagnosed as carefully as a physician examines into the symptoms of his patient. Of course, in a campaign for new business in a property which is just getting ready to make a bid for the patronage of the public, it is impossible to study the situation with the exactness that is attainable where the plant has been operating for some little time. In that case time has developed the weaknesses of the original estimates and conditions can be noted more accurately and the remedy applied more quickly and with a greater degree of certainty. But at that there is no reason why the development of the property originally should not be along comparatively safe and sure lines. It all depends upon the thought employed in formulating the plans and in their execution. With a new proposition there seems to be little or no excuse for anything but a successful issue.

It will be the aim of this and successive papers to bring forth some facts, figures and theories, proved by practice in one large property and several small ones, tending to show the proper manner in which to go about the development of telephone property. It will be our object to bring out the many factors entering into the grand result—the contract agent, the solicitor and his training, the plan of campaign and the preliminary necessary insight into attending conditions, the canvass for new business itself, advertising in its many forms and publicity in that it applies to telephony, the raising of rates, the development of special forms of service, the keeping of records, not only for the canvass proper, but for permanent exchange use, and other topics which it is believed will be found of interest to telephone contract agents, solicitors, managers and stockholders. It would, therefore, naturally appear that the first topic to be considered is the original canvass for new business. The franchise secured the first thing that appeals to the promotor and worries the constructing engineer is just where the subscribers are going to come from and their prospective alignment in relation to the general scheme of distribution in mind.

Subscribers unfortunately very seldom come to a pole line, and pole lines must be made to go to the subscriber, accordingly the engineer must know where his business is coming from, the number of patrons, the class of service and the prospective growth before he can lay out cable leads, etc. The canvassing department must tell him, and the information furnished from that source must be as accurate as it is possible to obtain. Just how to get this data for the engineer is the problem which takes deep thought. The first thing to do is to spot upon a map of sufficient detail to show plainly the streets, allevs and other by-ways the subscribers of the telephone company already in the field, should there be one, and indicate also the class of service in use by each subscriber. This can be arrived at by making a chart of the telephone numbers in the other company's directory and assigning the names to the numbers. This will show not only the service given in each case, whether individual or party line, and the number of

subscribers on each circuit, but the extra listings as well, and will give the contract agent an accurate idea of his opponent's strength with the exception of private lines, extension sets and other equipment ordinarily not listed in directories. This data is simply invaluable to the contract agent and should be secured and studied before actually instituting a canvass of any importance.

The development of the new company will follow in a great measure the lines of development of the company first on the ground. Not necessarily does it follow that the new company will get its growth from the losses of the old, although it will draw upon it to a certain extent. But it is true that one telephone brings another, and in a spirited campaign people will be educated to the use of the telephone who never have thought of it in any light but that of a luxury, and this increase naturally follows along the line of existing telephone growth. The engineer can, therefore, tell in a general way into what territory he must carry his main leads, but it is up to the contract agent to give him the information upon which the finer details of the distribution will be arranged. The first thing then after spotting the subscribers of the old company upon a map is to start a file of the names, arranging the same alphabetically and as to streets. Then a canvass should be put under way covering every desirable street and reaching every prospective user of the telephone within reasonable limits. One aim of the canvass will be, of course, to substract as much as possible from the old company's list, but this should not be the sole object.

In a territory already covered by telephone service is generally where additional telephones will be placed and under ordinary circumstances the best growth may be expected to come from the localities where the old company has devoted its best efforts. Having been long in the field, and in most cases fairly conversant with conditions, they have developed, in a way, the best of the local field. This does not mean, however, that the canvass should follow the lines of present development. It often happens that mediocre territory thoroughly canvassed brings surprising results. But an assault on the old company's list brings about a general discussion among users and non-users as to the merits of the old company's rates and service and what may be expected from the new company. These neighborhood discussions and doorstep consultations are great educators, and many non-users conclude to try the service of the new company, and remain subscribers for years. Education and experience prove the telephone to be an indispensable adjunct to their households and social life, instead of a luxury, as was their former belief. While the new plant will grow at the expense of the old, this is true in greater degree in business houses, etc., than in residences. In very few instances, where competition has entered territory hitherto untrodden except by emissaries from Boston, has the new company found the number of telephone users proportionate to the population of the community. As a rule, the development, not having the stimulus of competition, is far below the standard and furnishes a fertile field for the newcomer. A most apt illustration of that point is Columbus, Ohio, where, prior to the advent of competition, there were about 1,800 subscribers in a city of 110,000 people, as Columbus enumerated in 1899 and 1900. The rates were high and the service not very good. There had been no effort to extend the service beyond existing boundaries. The people were dissatisfied and rebellious. The Columbus Citizens' Telephone Company secured a franchise and put their solicitors into the field. In a few months the new company had secured 7,200 approved contracts, and that in a town where 1,900 telephones had been the high-water mark.

While canvassing for new business care should be taken to so write contracts as to intelligently load the circuits. For example, it would be bad judgment to mix indiscriminately measured and unlimited party line service in the same neighborhood. Of course, errors of this kind will creep in during the canvass, but should be turned back by the engineer in assigning subscribers to circuits prior to the cutting in of the plant. Intelligent canvassing is worth its weight in gold, for it can save much money in the original installation, but if it is careless, indifferent and unchecked it can put a burden upon a new property that will make it stagger. No canvass should be thought of, much less started, without first securing a good organization with the proper person at the head. Too much care cannot be exercised in selecting this man. A great deal depends upon the head in what is to follow. His coups may gain much and his mistakes may cost much. Don't be light with the purse strings when arranging for this man. Get the best man money will retain. It will pay. Then when he is secured "put it up to him," as they say in street parlance. Let him run his organization. He will be a good combination if you get the right sort. He will be, first of all, resourceful and indefatigable, tactful and courteous, a good mixer, possessed of good executive ability, and able to handle men, people and events. This is not an impossible combination, either; there are many men in the business to-day who possess these qualifications, but a man never arises to the best there is in him until responsibility is placed upon him. After he is placed in charge of the organization there must be absolutely no interference with his men. In him must be vested the right to employ and dismiss, for to secure results there must be organization, and without proper discipline there is no organization.

The ideal corps of solicitors works like a machine in the piling up of results. This machine must be watched, however, and it is only by eternal vigilance that victory is assured. The telephone business is primarily a business of details and the contract agent comes in for a goodly share. As the leader of the vanguard he blazes the way for the future success of his company. His pathway is never strewn with anything but thorns. He must be alert, must hold every string firmly in hand and must give every detail its measure of consideration. His men must be treated with consideration, tempered with firmness; they must secure to him a fair return in contracts at a moderate cost, the public must be treated courteously and fairly, and with the idea of making friends for the company, but at the same time avoiding the giving of ill-advised concessions and going contrary to the established policy. He must know something of the operating end of the business so that he won't allow his men to make mistakes in taking business the company cannot maintain profitably—in short, he must know pretty much of the entire business in all of its departments. The advertising may be assigned to his department, and he should be able to look after that in addition to his other duties. So much for the contract agent, the man who heads the canvass. In the next paper that most useful assistant to the contract agent—the solicitor—will be discussed—what he should be, what he should know, how he should be trained and what should be expected from him.

There is before the Navy department a project which, if proved to be feasible, will allow of telephonic communication under the water between vessels. It is proposed to try the invention on lightships along the coast from New York to Boston. The sending apparatus consists of a bell sunk about fifty feet in the water and operated by electricity from the decks of the ship. In thick weather, when the lightships signals fail to carry through the fog, this submarine bell is rung constantly, and ships that have the receiving apparatus can be informed of their near approach to the shoal by the transmission of the sound under water for perhaps three or four miles away.

RECENT LEGAL CITATIONS AFFECTING TELEPHONY

By Gilbert W. Hand

Appliances: Duty to furnish modern.
Richmond & Petersburg Electric Company v. Rubin, 47 S. E. 834; TELEPHONY, 8-3-226.
Necessary to provide those in general use.
Van Vechten v. N. Y. Telephone & Telegraph Company, 58 A. 1096; TELEPHONY, 9-2-159.

Assignments: Understanding that ownership of wire is to be transferred by assignment does not operate to effect such transfer in absence of compliance with method of procedure declared essential by law.
Lee v. Maryland Telephone & Telegraph Company, 55 A. 680.

Abutting Owner: Telephone line not an additional servitude in Kentucky.
Cumberland Telephone & Telegraph Company et al v. Avritt et al, 85 S. W. 204; TELEPHONY, 9-5-422.
Citing:
Pierce v. Drew, 49 Am. Rep. 7.
Julia Bldg. Assn. v. Bell Telephone Company, 57 Am. Rep. 398.
McGee v. Oversheimer (Ind.), 49 N. E. 951.
Caster v. N. W. Telephone Exchange Company (Minn.), 63 N. W. 111.
Hirchfield v. Rocky Mountain Bell Telephone Company (Mont.), 29 P. 883.
Southern Bell Telephone Company v. Francis (Ala.), 19 South 1.
Kirby v. Citizen's Telephone Company (S. D.), 97 N. W. 3.
Two rules and recent cases on rule that telephone is not additional servitude.
American Telephone Journal, 10-16-267.
Not additional servitude in Kansas—reversal of previous ruling.
McCann v. Johnson County Telephone Company, Supreme Court, Kansas, May 7, '04. TELEPHONY, 8-1-19.
Entry by company on highway as a trespasser followed by permission of land owner held to create an implied license revocable at will of land owner.
Little v. American Telephone & Telegraph Company, 89 N. Y. S. 136.
Conduit under sidewalk is not an additional servitude.
Coburn v. New Telephone Company, 156 Ind. 90.
Telephone line not an additional servitude in Michigan, 123 M. 51.
Telephone line not an additional servitude in Kansas
McCann v. Johnson County Telephone Company, 76 Pac. 870.
Telephone line no additional servitude in city (S. D.).
Kirby v. Citizens' Telephone Company, 97 N. W. 3.
Abutting lot owner cut pole and then brought injunction to prevent company from replacing it, held could not claim right to injunction on ground of preserving status quo, he having destroyed it.
Post v. Hudson River Telephone Company, 78 N. Y. S. 576; TELEPHONY, 5-1.
Abutting owner not entitled to damages because of laying conduit in street even though he had fee to the center thereof.
Castle v. Bell Telephone Company, 13 N. Y. S. 482.
Abutting owner—right of abutting owner who does not own fee in street—removal of poles from street.
Halleran v. Bell Telephone Company, 71 N. Y. S. 685.
Abutting owners and rural highways in Ohio.
2 American Electrical Cases 237.
Fee of highway is in abutting owner—public has easement only—poles and wires are an additional servitude.
McCann v. Johnson County Telephone Company (Kan.), Pacific Reporter, later reversed and see 76 Pac. 870.
Not an additional servitude in Kansas. TELEPHONY, 8-1-19.

Gilbert W. Hand.

Common Carriers: Companies are common carriers in South Carolina.
Gwynn v. Citizens' Telephone Company, 48 S. E. 460. TELEPHONY, 8-5-409.
Companies are common carriers and bound by same rules.
Hackett v. State, 105 Ind. 250; 14 Ind. App. 341.
Companies must send messenger for person wanted at station.
Central Company v. Swoveland, 14 Ind. App. 341.
Subway companies are not common carriers.
Brush Electric Company v. Consolidated Subway Company, 15 N. Y. S. 81.

Connections: Connections with opposite companies.
Express Cases, 117 U. S.; to 6 Sup. Ct. 542, 628.
Barney v. Steamboat Company, 67 N. Y. S. 301.
People v. Hudson River Telephone Company, 19 Abb. (N. C.) 466.
People v. Central N. Y. Telephone Company, 58 N. Y. S 221.
Chicago & St. P. Ry. Company v. Mins, 134 U. S. 418.
Railway Company v. Gill, 156 U. S. 49; 15 Sup. Ct. 484.
Shepard v. Telephone Company, 38 Hun (N. Y.) 338.
Statute prohibiting discrimination between companies.
53 N. Y. S. 574.
Contract for connections construed—mandamus.
Campbellsville Telephone Company v. Lebanon Telephone Company, 77 S. W. 1114.
Pleading in case for damages for unlawful discrimination.
Phillips v. S. W. Telegraph & Telephone Company (Ark.), 81 S. W. 605.
Wilful discrimination is a breach of contract.
Cumberland Telephone & Telegraph Company v. Hudson, 71 S. W. 435.
Connections with interior systems.
Gardner v. Providence Telephone Company, 49 A. 1004.
Damages for failure to make connections.
Haber Blum, Block Hat Company v. Southern Bell Telephone & Telegraph Company (Ga.), 45 S. E. 696.
Refusal to make connections renders company liable.
Central Company v. Fehring, 146 Ind. 189.
Duty to furnish connections, enforcement by mandamus notwithstanding a previous debt.
State v. Nebraska Telephone Company, 22 N. W. 237.

Common Carriers: Outside of its field a common carrier becomes private.
State v. Lebanon Telephone Company (Ind.).

Contracts: Duration of contract for connections.
Campbellsville Telephone Company v. Lebanon L. & L. Telephone Company, 84 S. W. 519.
Construction of for sale of telephone line.
Murphy et al v. Smith Walker & Company et all (Tex.), 84 S. W. 678; TELEPHONY, 9-4-343.
Unnecessary to allege performance when shown that defendant has repudiated contract—suit on contract by one for whose benefit it was made, though not a party.
Foster v. Leininger, 72 N. E. 164; TELEPHONY, 9-1-33.
Duration and construction of.
Campbellsville Telephone Company v. Lebanon, Etc., Company, 77 S. W. 1114.
Interrupted service—there must be notice of, to enable subscriber to set off damages in an action for rental.
Atlantic Company v. Porter, 43 S. E. 441.
Contract by telephone, place of making.
Bank v. Sperry Flour Company, 74 Pac. 855.

Garretson v. North Atchinson Bank, 47 Fed. 867.

Contracts that dissolve *quasi public* corporations void.
Cumberland Telephone & Telegraph Co. (Ind.), 127 Federal 187.

Contract to divide profits according to expenses not void as being against public policy.
9 Abb. (N. C.) 214.

A company cannot contract against its own negligent acts.
Telephone Company v. Swoveland, 142 Ind. App. 341.

Vendor who operates under predecessors' franchises bound by their obligations, not so for their torts unless torts have been placed in judgment.
Mahan v. Michigan Telephone Company, 93 N. W. 629.

Rewards—cutting wires—contract to pay for.
South Western Telephone Company v. Priest, 72 S. W. 241.

Contract ratified where company used a plant which it had bought though could show no authority of president to make.
Badger Telephone Company v. Wolf River Telephone Company, 97 N. W. 907.

Contract that cannot be assigned, act of selling business puts an end to contract.
Sullivan v. Chicago Board of Trade; TELEPHONY, 9-1-34.

Construction of contract and duration of same, not determinable at will of either.
Campbellsville Telephone Company v. Lebanon L. & L. Telephone Company, 80 S. W. 114; TELEPHONY, 8-5-408.

Construction of—statute of frauds—contract only signed by one party—sale of stock part of contract of subscription.
Co-operative Telephone Company v. Katus (M.), 12 D. L. N. 187; TELEPHONY, 10-1-71.

To give telephone service for privilege of placing poles on premises valid.
Anderson v. Mt. Sterling Telephone Company et al., 86 S. W. 1119; TELEPHONY 10-2-175.

With subscriber. Relation is that of landlord and tenant.
Query. American Telephone Journal, 10-3-41.

Unnecessary to allege performance where shown that defendant has repudiated it.

Suit on contract by one for whose benefit it was made, though not a party.
Foster v. Leminger, 72 N. E. 164; TELEPHONY, 9-1-33.

Corporations: Grant to incomplete corporation, not void.
Chicago Telephone Company v. North Western Telephone Company, 199 Ill. 324.

Consolidation of corporations—compliance with law.
Cum. & Company v. Morgans Company, 36 South 352.

Foreign in Pennsylvania, requisites to doing business.
Kilgore v. Smith, 122 Pa. St. 48.
Commonwealth v. Oil Company, 101 Pa. St. 119.

Director is an officer.
Eastman v. York State Telephone Company, 83 N. Y. S. 1019.

Power to employ counsel—act of president of corporation binds corporation—remedy against president, action in damages.
Fernald v. Spokane & British Columbia Telephone & Telegraph Company, 72 Pac. 462.

Individual may complete incorporation under an act forbidding it by corporations.
Haines v. Crowley, 47 A. 137.

Corporations cannot sell out unless franchise and ordinance provide for such sale.
Cumberland Telephone Company v. City of Evansville, 1903 Federal Court of Indiana.

Illegal incorporation by committee of subscribers. Majority of subscribers having repudiated their action.
Mt. Carmel Telephone Company v. Mt. Carmel & Flemingsburg Telephone Company, 84 S. W. 515; TELEPHONY, 10-5-353.

Crossings: Insulation required at.
Hebert v. Lake Charles Ice, Light & Waterworks Company, 35 South 731.

Railroad right of way.
St. Louis & C. R. Company v. Postal Telegraph Company, 51 N. E. 382.

The relation between telegraphs and telephones.
55 Central Law Journal 6.

Public and private rights of way in New York—additional burden to rural highway.
Eels v. American Telephone & Telegraph Company, 38 N. E. 202.

One telephone line with another.
1495 N. W. 460.
1465 N. E. 329.

Telephone company crossing railroad track—its right to do so—guard wires—cross-arms.
American Telephone Journal, 9-9-137.

Damages: "Liquidated damages" and "penalty," distinction between guaranty fund declared forfeited.
City of Detroit v. People's Telephone Company, 10 Det. Legal News, 935; TELEPHONY, 7-5-355.

Measure of damages in Texas.
St. Louis Southwestern Railway Company v. Hughes, 73 S. W. 976; TELEPHONY, 6-1-31.

Damages for failure to transmit messages—penalty applies to written messages only.
Cumberland Telephone & Telegraph Company v. Saunders, 35 South 653.

Check deposited as guaranty to build in certain time, held liquidated damages.
Detroit v. People's Telephone Company, 101 M. 935.

Discrimination: Rule where subscriber lives outside jurisdiction of company's business.
Crouch v. Arnelt et al. (Kan.), 79 P. 1086; TELEPHONY, 10-1-72.

Electricity: Companies are bound to exercise high degree of care in use of.
Norfolk Railway & Light Company v. Sprately, 49 S. E. 502; TELEPHONY, 9-4-343.

Lineman injured by electric light wire.
Barto v. Iowa Telephone Company, 101 N. W. 876.

Care required of those handling electricity—rule in Connecticut.
McAdam v. Central Railway & Electric Company, 35 A. 341; TELEPHONY, 10-6-418.

Injury caused by children throwing broken telephone wires over electric light wire.
Star v. Muskegon Traction & Lighting Company, 12 D. L. N. 550; TELEPHONY, 10-6-418.

Incompetency of servant in use of as ground of liability.
Scott v. Iowa Telephone Company, 102 N. W. 432; TELEPHONY, 10-6-419.

Eminent Domain: Companies have right of eminent domain in Georgia—easement—damages. TELEPHONY, 8-3-226.

Rule that property cannot be taken without just compensation does not extend to exercise of police power in a lawful manner (Tex.).
Houston T. C. Railway Company v. City of Dallas, 84 S. W. 648; TELEPHONY, 9-4-343.

Eminent domain is conferred upon companies by statute in South Carolina.
South Carolina & G. R. Company v. American Telephone & Telegraph Company, 43 S. E. 970; TELEPHONY, 6-3-162.

Jury's estimate in condemnation proceedings not necessarily conclusive in Louisiana.
Texas & Pacific Railway Company v. Southern Development Company, 27 South 101; TELEPHONY, 8-6-521.

Companies cannot assert right of eminent domain in Pennsylvania. TELEPHONY, 7-4-249.

Rights acquired in condemnation proceedings in Kansas.
Missouri, Kansas & North Western Railway Company v. Schmuck, 76 Pac. 836; TELEPHONY, 8-3-225.

Title by eminent domain only an easement in Colorado.
Union Pacific Railway Company v. Colorado Postal Telegraph Cable Company, 69 Pac. 564; TELEPHONY, 6-3-162.

Companies may exercise right of eminent domain in Ohio.
Cleveland Railroad Company v. Ohio Postal Company, 67 N. E. 892; TELEPHONY, 6-3-162.

Discussion of question of eminent domain in relation to telephone companies in West Virginia.
Maxwell v. Central District & Printing Telegraph Company, 41 S. E. 125; TELEPHONY, 6-2-88.

Companies must first endeavor to settle disputes else courts will enjoin condemnation proceedings in Georgia.
City of Ellerton v. Hobbs, 49 S. E. 780; TELEPHONY, 9-4-342.

Eminent domain in Arkansas—right of.
St. Louis & San Francisco Railroad Company v. Southern Telegraph & Telephone Company, 121 Fed. 276; TELEPHONY, 6-1-31.

Right to lay gas pipes does not include right to erect telephone line.
Woods v. Greensboro Natural Gas Company, 54 A. 470; TELEPHONY, 5-6-337.

Companies do not possess right of, in Pennsylvania.
Pennsylvania Telephone Company v. Hoover, 58 A. 922.

Condemnation proceedings—meaning of "right of way"—statute construed.
South Carolina & G. R. Company v. American Telephone & Telegraph Company, 43 S. E. 970.

Expropriating a right of way—Louisiana law constitutional—insufficiency of award.
Southwestern Telephone Company v. K. S. S. & G. Railway Company, 33 South 910.

Power to operate a gas company does not give power to operate a telephone line—corporate powers—ultra vires.

Condemnation of easement along railroad right of way.
St. Louis & San Francisco Railroad Company v. South Western Telegraph & Telephone Company, 121 Fed. 276.

Construction of Statute "along and parallel to any of the railroads in the city."
S. W. Telephone Company v. K. C. Company, 33 South 910.

Condemnation of mineral land, rule as to measure of damages.
Missouri K. & N. W. Company v. Schmuck (Kan.), 76 Pac. 836.

Condemnation of right of way over railroad—jury.
Cumberland Telephone & Telegraph Company v. Morgan's Company (111 La.), 36 South 352.

Corporations have right to jury trial in condemnation proceedings.
City of St. Louis v. Roe et al. (Mo.), 83 S. W. 435; TELEPHONY, 9-2-160.

In California—value of fee and easement.
Southern Pacific Railroad Company v. San Francisco Company et al., 79 P. 961; TELEPHONY, 10-1-71.

In West Virginia—word "companies" in a statute includes individuals—no additional servitude in this state—no distinction between city and rural highways.
Louther v. Bridgeman, 50 S. E. 410; TELEPHONY, 10-4-282.

Companies are not authorized to take private property by, in Pennsylvania.
Pennsylvania Telephone Company v. Hoover, 58 A 922; TELEPHONY, 8-6-522.

Measure of damages in condemnation proceedings in Texas.
Lettegast v. Houston O. L. & M. Railway Company, 87 S. W. 197; TELEPHONY, 10-4-284.

Eminent Domain (Iowa). Public use means such use as will inure to the benefit of the parties concerned, as members of the community.
Sisson v. Board of Supervisors, 104 N. W. 454; TELEPHONY, 10-5-353.

No exclusive franchise for use of streets in Alabama.
Montgomery Light & Water Power Company v. Citizens' Light, Heat & Power Company, 38 So. 1026; TELEPHONY, 10-5-354.

Evidence: Telephone conversations are admissible in evidence.
McCarthy v. Peach, 70 N. E. 1029; TELEPHONY, 8-2-123.

Contract made over telephone is made where person is who accepts offer.
Bank of Yolo v. Sperry Flour Company, 74 Pac. 855; TELEPHONY, 8-3-226.

Admissibility of conversations over telephone.
Lillie v. State, 100 N. W. 320; TELEPHONY, 8-4-328.

Communications over telephone as evidence.
Globe Printing Company v. Stahl, 23 Mo. App. 451; TELEPHONY, 6-3-163.

Charges for expert opinion.
Rosewater v. Glenn Telephone Company, 80 N. Y. S. 880; TELEPHONY, 5-5-286.

Evidence of condition of wire months afterward not competent in case of alleged negligence.
Hannum v. Hill (W. Va.), 43 S. E. 223.

Number of witnesses as bearing on preponderance of.
Campbell v. Delaware & Atlantic Telephone & Telegraph Company, 56 A. 303.

Identity of party must be established before conversation over telephone can be admitted.
Young v. Pacific Transfer Company (Wash.).

Runaway caused by poles lying by roadway—expert testimony.
Missouri & Kansas Telephone Company v. Vadevort, 14 Am. Neg. Rep. 291.

Ejectment: Ouster of company from highway.
Little v. American Telephone & Telegraph Company, 89 N. Y. S. 136; TELEPHONY, 9-1-34.

Forfeiture of Charter: What misuses will work—legality of purchasing competing companies.
State of Cumberland Telephone & Telegraph Company, 86 S. W. 390; TELEPHONY, 10-4-283.

Franchise: Passed at special meeting of trustees, invalid.
Rough River Telephone Company v. Cumberland Telephone & Telegraph Company, 84 S. W. 517.

Void sale of—no provision for sale in ordinance.
Cumberland Telephone & Telegraph Company v. City of Evansville, 127 Fed. 187.

Company given permission by resolution to enter village, latter could not thereafter deny company to do business.
Village of London Mills et al. v. White et al., 70 N. E. 31.

Sale of franchise in Wisconsin.
Badger Telephone Company v. Wolfe River Telephone Company, 97 N. W. 907; TELEPHONY, 8-1-19.

Franchise can only be declared void by competent court.
City of Freemont v. Nebraska Telephone Company; TELEPHONY, 8-1-18.

Attempt to annul ordinance, construction of statutes.
Old Colony Trust Company v. City of Wichita, 123 Fed. 762; TELEPHONY, 6-4-242.

Exclusive franchise—injunction.
Cumberland Telephone & Telegraph Company v. Home Telephone Company, 72 S. W. 4; TELEPHONY, 5-4-211.

Exclusive franchise against public policy.
Muskogee National Telephone Company v. Hall et al., 118 Fed. 382; TELEPHONY, 5-3-155.

Free service to city, validity of.
New Williams v. Great Southern Telephone & Telegraph Company, 40 Am. Elec. Cases 122.

A contract without consideration where state law gives right to erect lines.
Macklin v. Home Telephone Company, 24 O. Cir. Ct. R. 446.

Termination of. by city.
City of Wichita v. Old Colony Trust Company, 132 Fed. 641; TELEPHONY, 9-1-33.

Exclusive franchise.
Pensacola Telephone Company v. Western Union Telegraph Company, 96 U. S. 1.

Creek nation has no right to grant exclusive franchise because it would obstruct interstate commerce.
Muskogee National Telephone Company v. Hall, 118 Fed. 382.

Franchise granted by county must be recognized by town subsequently incorporated.
38 Vt. 193; 100 U. S. 514.

Difference between franchise and revocable license.
Boston Electric Light Company v. Boston Terminal Company (Mass.).

Franchise or license assignable.
People v. Central Union Telephone Company, 61 N. E. 428.

Exclusive franchise—sale to highest bidder.
47 S. W. 959; 121 M. 513; Joyce on Electric Law p. 189; 3 Am. Elec. Cases 72.

Discussion of question of exclusive franchise in Alabama.
American Telephone & Telegraph Company v. Morgan's County Telephone Company, 36 South 178.

When city is estopped to question authority to grant.
Village of London Mills v. White, 70 N. E. 313.

Validity of franchise—not sustained where granted at same meeting that it was introduced.
Maraman v. Ohio Valley Telephone Company, 79 S. W. 398.

Private citizen cannot maintain injunction to annul franchise of company.
Clark v. Interstate Telephone Company, 101 N. W. 977; TELEPHONY, 9-3-254.

Council may grant more favorable franchise to one company than to another.
American Telephone Journal, 9-3-42.

Sale of, in Wisconsin.
Badger Telephone Company v. Wolfe River Telephone Company, 97 N. W. 907; TELEPHONY, 8-1-19.

Exclusive.
American Telephone & Telegraph Company v. Morgan Co. Telephone Company (Ala.), 36 S. 178.

Authority of telephone company to do electric lighting business in Maryland, consent of city.
Brown v. Maryland Telephone & Telegraph Company, 61 A. 338; TELEPHONY, 10-4-284.

Agreement to transfer ultra vires and void except in Wisconsin and Michigan. Query.
American Telephone Journal, 10-25-417.

Interference: Distance wires of different companies may lawfully be placed from each other.
Northern Telephone Company v. Iowa Telephone Company, 98 N. W. 113; TELEPHONY, 7-6-438.

Cutting dead wires not an interference with the transmission of messages.
South Western Telegraph & Telephone Company v. Priest et al., 72 S. W. 241; TELEPHONY, 5-5-286.

Wire over building—proper method of construction.
Chicago Telephone Company v. North Western Telephone Company, 65 N. E. 329.

Under building, company held to have exclusive right—injunction.
Northwestern Telephone Exchange Company v. Twin City Telephone Company (Minn.), 95 N. W. 460.

Right of injunction by first occupant.
Nebraska Telephone Company v. York Lighting Company, 43 N. W. 126.

Distance between adjacent wires.

Northern Telephone Company v. Iowa Telephone Company, 98 N. W. 113.

Damages from conduction.
Wisconsin Telephone Company v. Street Railway, 3 American Electrical Cases 383.

Interference with subways.
North Western Telephone Company v. Electric Light & Power Company (N. Y.), 70 N. E. 866.

Interference with street railway and telephone lines—guard wires.
Richmond Electric Railway Company v. Rubin, 47 S. E. 634.

Interference, telephone wires and electric light wires.
North Western Telegraph Company v. Guernsey & Scudder Electric Light Company, 46 Mo. App. 120; 3 Am. Elec. Cases 425.
Paris Electric Light & Railway Company v. South Western Telegraph & Telephone Company, 5 Am. Elec. Cases 262; Jones, Electric Law, p. 517.

Telephone line by railroad.
Railway Company v. European Electric Printing Telegraph Company, 9 Exchange 363.
Allen's Telegraph Cases 8.
South Western Telegraph & Telephone Company, 27 S. W. 38.
Gross v. Southern Chicago City Railway Company, 73 Ill. App. 217.
Joyce, Electric Law 419.

Conduction, induction and contact—rights of street railway and telephone company.
Hudson River Telephone Company v. Railway Company, 135 N. Y. 393; 4 American Electrical Cases 276.
State ex rel. v. Railway Company, 87 Wis. 72; 4 American Electrical Cases 289.
Cumberland Telegraph & Telephone Company v. United Electric Railway Company, 93 Tenn. 492; 4 American Electrical Cases 297.

Legislative Control: Cannot maintain for trespass not threatened.
Sunset Telephone & Telegraph Company v. City of Eureka et al., 122 Fed. 960; TELEPHONY, 6-4-241.

Municipal regulation and control of telephone and telegraph companies.
56 Central Law Journal 125.

Control by legislature—all applicances used by companies that are devoted to public use, subject to.
Hackett v. State, 105 Ind. 250.

Power of municipality to prescribe painting of poles and color.
American Telephone Journal, 9-25-393.

Limitation: Statute of limitations barred right of action for deceased's death.
Poff v. New England Telephone & Telegraph Company (N. H.), 55 A. 891.

License: License fees—rule when valid.
Norfolk & Western Railway Company v. Town of Suffolk, 49 S. E. 658; TELEPHONY, 9-4-343.

Pole rental for use of streets.
City of Pensacola v. Southern Bell Telephone Company, 37 South. 820; TELEPHONY, 9-4-343 and cases cited.
City of Allentown v. Western Union Telegraph Company, 23 A. 1070.
City of Philadelphia v. Atlantic & Pacific Telephone Company, 102 Fed. 254.
City of Philadelphia v. Postal Telegraph Company, 21 N. Y. Supp. 556.
Western Union Telegraph Company v. Borough of New Hope, 187 U. S. 419.

Not a vested right.
Radfield Telephone & Telegraph Company v. Cye, 49 A. 1047.

License tax on poles in Pennsylvania:
Louise Merion Twp. v. Postal Telegraph Cable Company, 25 Pa. Sup. Court 306; TELEPHONY, 10-1-72.

Master and Servant: Fellow servant—duty to furnish proper tools cannot be delegated to fellow servant.
Orr v. Southern Bell Telephone & Telegraph Company, 44 S. E. 401.

Mandamus: Does not lie to compel installation of telephone in disorderly house.
Godwin v. Carolina Telephone Company, 48 S. E. 636.

To compel company to place telephone which has been before raided as a pool room; TELEPHONY, 10-2-175.

May be used to compel connections.
Telephone Company v. State, 118 Ind. 194; 123 Ind. 113.

Mortgages: After—acquired property, former covered latter (N. J.).
Monmouth County Electric Company v. Central Railway Company, 54 A. 10.

Negligence: Actionable negligence exists only when company owes injured party some duty.
Cumberland Telegraph & Telephone Company v. Martin's Admr., 63 L. R. A. 469; TELEPHONY, 8-5-408.

Incompetency of servant—duty of master—knowledge by company—what is reasonable care.
Scott v. Iowa Telephone Company, 102 N. W. 432; TELEPHONY, 9-4-343.

Insulation of wires—Kentucky rule—perfect protection.
Paducah Railway & Light Company v. Bell's Admr., 85 S. W. 216; TELEPHONY, 9-5-421.

Injury to lineman—inspection of poles not required in United States Court of Appeals (Sixth Circuit).
Britton v. Central Union Telephone Company, 131 Fed. 846; TELEPHONY, 8-6-522.

Liable for acts of messenger—rules, promulgation of.
Central Union Telephone Company v. Swoveland, 42 N. E. 1035; TELEPHONY, 7-6-439.

Wire attached to chimney—injury to passerby—proximate cause.
Leeds v. New York Telephone Company, 70 N. E. 219; TELEPHONY, 7-6-438.

Duty to furnish reasonably safe place to work.
Harp v. Cumberland Telegraph & Telephone Company, 80 S. W. 510; TELEPHONY, 8-2-121.

Proximate cause.
Cumberland Telephone & Telegraph Company v. Ware's Admrx., 74 S. W. 289; TELEPHONY, 6-1-30.

Want of due care in taking down telephone poles.
Kyes v. Valley Telephone Company, 93 N. W. 623; TELEPHONY, 5-6-336.

Notice a bar to recovery.
Leach v. Central N. Y. Telephone & Telegraph Company, 80 N. Y. S. 1037; TELEPHONY, 5-5-286.

What is "ordinary care"?
Cumberland Telephone & Telegraph Company v. Warner, 79 S. W. 199; TELEPHONY, 8-3-225.

Failure to provide reasonably safe place to work.
Walsh v. New York & I. C. Railway Company, 80 N. Y. S. 767; TELEPHONY, 5-5-286.

Pole an appliance, not a place.
Britton v. Central Union Telephone Company, 131 Fed. 846.

Where omission of duty was concurrent, telephone and traction companies were not improperly joined as defendants.
Graves v. City Association, 132 Fed. 387.

Negligence in delivering messages—telegraph and telephone companies are under same duty when they hold themselves out to public that they deliver messages.
Martin v. Sunset Company, 51 Pac. 376; 18 Wash. 260.

Liability for damages from lightning.
63 L. R. A. 219.

Failure to insulate wires that afterward fell on highway—knowledge by person injured of dangerous condition.
Parsons v. Charleston Consolidated Railway Company (S. C.). 48 S. E. 284.

Obstruction of highway by sagging wire—knowledge of dangerous condition by person injured.
Smith v. Gilreath (S. C.), 48 S. E. 262.

Negligence causing loss of stock of goods by fire due to contact of wire with building.
Richmond Electric Railway Company v. Rubin, 47 S. E. 834.

Fact that employe knew of live wires does not affect his right of recovery where he was informed that the wires were properly insulated—proximate cause for the jury.
Hamworth v. Mineral Belt Telephone Company (Mo.). 79 S. W. 727.

Not contributory negligence to rescue a fellow workman and rescuer may recover *if injured under certain conditions.*
Whitworth v. Shreveport Belt Railway Company (112 La.), 36 South. 414.

Servant injured by explosion of dynamite in post hole—fellow servant.
Harp v. Cumberland Telephone Company (Ky.), 80 S. W. 210.

Injury caused by horse running into pole which was near highway.
Alice, Wade City, Etc., Company v. Billingsley, 77 S. W. 255.

Damages sustained from defective crossings recoverable—excessive damages reduced.
Hebert v. Lake Charles Company, 35 South. 731.

Degree of care—"skillful," as well as "ordinarily prudent," proper in telephone business.
Cumberland Telephone & Telegraph Company v. Warner, 79 S. W. 199.

Contributory negligence—plaintiff had seen fallen wire, but forgot it, held not guilty of.
West Kentucky Company v. Pharis, 78 S. W. 917.

Pole broken by runaway horse—company had right of action against owner of horse.
21 (Hun. N. Y.) 22.

Liability for breaking electric wires—between parties having no contract relation with each other.
117 Ga. 191; 17 Harvard Law Review 288; 10 Detroit Legal News 47.

Liability for failure to insulate wires.
Parsons v. Charleston Consolidated Gas & Electric Company; 48 S. E. 248; TELEPHONY, 9-1-248.

Question for jury whether company was negligent in not guarding its wires.
Burton Company v. Gordon, 25 Ohio Circuit Court Reports 641; TELEPHONY, 9-1-34.

Telephone and traction company jointly charged with liability—liability of parties.
Graves v. City and Suburban Association, 132 Fed. 387; TELEPHONY, 9-1-34.

Injury caused by falling over loose wire.
Texas & Pacific Telephone Company v. Prince, 82 S. W. 327; TELEPHONY, 9-2-161.

Injury caused by electric wiring conveyed over defective telephone apparatus.
Lynchburg Telephone Company v. Bokker, 50 S. E. 148; TELEPHONY, 9-6-518.

Defects at other times and places do not prove a defect at particular place.
United Electric Light & Power Company v. State to use of Lisby, et al., Court of Appeals of Maryland, 60 A., 248; TELEPHONY, 9-6-518.

Where there is no duty to warn of danger there is no liability in case of injury.
Rowe v. Taylorville Electric Company, Supreme Court of Illinois, 72 N. E., 711.

Lineman thrown from pole by bicyclist—construction of rule that "linemen shall furnish tools."
Hyland v. Southern Bell Telephone & Telegraph Company, 49 S. E. 879; TELEPHONY, 10-1-71.

Degree of care—defective insulation.
Winklemann v. Kansas Electric Light Company, 85 S. W., 99; TELEPHONY, 10-1-72.

Fellow servant rule in South Carolina—constitutional provision.
Brablam v. American Telephone & Telegraph Company, 50 S. E. 716; TELEPHONY, 10-2-175.

Electric wire found dangling across street some evidence of.
Linton v. Weymouth Light & Power Company, 74 N. E. 321; TELEPHONY, 10-3-215.

Injury to lineman—defective construction disclosed by effect of storm—liability under such circumstances.
Smith v. M. & K. Telephone Company, 87 S. W. 71; TELEPHONY, 10-3-216.

Employe became frightened—ran and was injured—fellow servant rule in Washington—contributory negligence.
Sandquist v. Independent Telephone Company, 80 Pacific 539; TELEPHONY, 10-3-216.

Duty of company to erect guards in crossing over electric light wires—accidents due to storm of unusual severity.
Heidt v. Southern Telephone & Telegraph Company et al., 50 S. E. 361; TELEPHONY, 10-3-216.

Injury from falling over pile of stones placed on sidewalk.
White v. Keystone Telephone Company, 60 A. 998; TELEPHONY, 10-4-284.

Injury from dull pike pole which was originally furnished in good condition.
Thorne v. United Gas & Power Company, 81 Pac. 124; TELEPHONY, 10-5-354.

What is a sufficient inspection in Michigan?
Warren v. City Electric Company, 12 Detroit Legal News, 415; TELEPHONY, 10-5-354.

No liability on part of railroad for permitting telephone poles to remain near former—poles being on land of another over which railroad had no control.
Chattanooga Electric Railway Company v. Moore, 82 S. W. 478; TELEPHONY, 10-6-419.

Strike of employes will not excuse negligence of a company in permitting a wire to remain in dangerous place during strike.
Cleary v. St. Louis Transit Company, 83 S. W. 1029; TELEPHONY, 9-3-254.

Injury to lineman.
Barto v. Iowa Telephone Company, 101 N. W. 876; TELEPHONY, 9-3-254.

Notice: Notice to agent is notice to corporation.
Baries v. Louisville Electric Light Company, 85 S. E. 1186; TELEPHONY, 10-1-72.

Officers: Powers of an acting president.
Fernald v. Spokane & British Columbia Telephone & Telegraph Company, 72 Pac. 462; TELEPHONY, 6-1-30.

Sufficiency of service of process on officer in Georgia.
Southern Bell Telegraph & Telephone Company v. Parker, 47 S. E. 194; TELEPHONY, 8-2-123.

Ordinances: Failure to comply with—injunction—location of poles.
New Castle v. Central District & Printing Telegraph Company (Pa.); TELEPHONY, 7-4-248.

Operation: Duty to establish guard wires.
McKay v. Southern Bell Telephone Company, 31 L. R. A. 42-3; United Electric Railway Company v. Shelton, 89 Tenn. 423.

Duty of company to keep lines in good repair and if authorities refuse permission to make repairs company has authority to compel by legal proceedings.
United States Illuminating Company v. Grant, 65 Hun. (N. Y.) 222; 3 American Electrical Cases 95.

Ownership: May be by private individual in Indiana.
Magee v. Overshiner, 150 Ind. 127.

Patents: Exclusive contracts not upheld by patent laws.
Commercial Union Telephone Company v. New England Telephone Company, 61 Vt. 241; 15 A. S. R. 893; Minnesota v. Illinois, 94 United States 113.

Effect of non-payment of costs in patent suits.
Kellogg Switchboard & Supply Company v. Glenn Telephone Company, 121 Fed. 144.

Self restoring drop patent suit.
United States Circuit Court of Appeals, American Telephone Journal, 9-17-26.

Personal Injuries: Superintendent while installing armature is a fellow servant of repair man while working on wire—damages.
Williams v. North Wisconsin Lumber Company, et al., 102 N. W. 589.

Defective insulation—electrically conveyed over telephone wire—injuries therefrom.
Parsons v. Charleston Consolidated Railway, Gas & Electric Company, 48 S. E. 284; TELEPHONY, 8-4-329.

Tripping over wires.
Smith v. Gilreath, 48 S. E. 262; TELEPHONY, 8-4-329.

Two underlying principles in every personal injury case.
81 N. Y. S. 1085; TELEPHONY, 6-2-88.

Proximate cause.
Georgetown Telephone Company v. McCullough's Admr., 80 S. W. 782.

Discussion of contributory negligence.
Columbus Railway Company v. Dorsey (Ga.), 46 S. E. 635.

Persons injured by falling brick—remote to proximate cause.
Leeds v. New York Telephone Company, 80 N. Y. S. 114; 70 N. E. 219.

Deceased killed in electric storm in metal proof shed where he had sought shelter—lightning struck pole distant 600 yards and was carried to shed by wire negligently attached to house—held no liability because company owed deceased no duty.
Martin's Admr. v. Cumberland Telegraph & Telephone Company, 76 S. W. 394.

Crossarm in which there was a defect when purchased covered with paint—not negligence to use.
Maryland Telephone & Telegraph Company, 55 A. 81.

Negligence of company a question for the jury where storm caused sagging of wire into which plaintiff's wagon ran.
Friesenham v. Michigan Telephone Company, 96 N. W. 501.

Injury to lineman from pole falling due to "dry rot"—duty to inspect poles—plaintiff not bound to use highest degree of care.
Walsh v. N. Y. & I. C. Company, 80 N. Y. Supp. 767.

Death caused by falling pole—contributory negligence.
Keyes v. Valley Telephone Company (M.), 93 N. W. 623.

Lineman killed by falling pole—contributory negligence.
Leach v. Central New York Telephone & Telegraph Company, 80 N. Y. Supp. 1037.

Lineman injured by falling from pole.
Black v. Rocky Mountain Bell Telephone Company, 73 Pac. 514.

Injury to lineman—joint wrong doers separately liable.
Cumberland Telephone & Telegraph Company, 74 S. W. 89.

Companies liable to persons traveling in highway where injuries are due to poles in street if plaintiff exercised due care.
Jeremiah Riley v. New England Telephone & Telegraph Company, 68 N. E. 17.

Helping fellow employe out of danger.
Whitworth v. Shreveport Belt Railway, 36 South. 414; TELEPHONY, 8-2-122.

Negligence—two principles in personal injury case.
Shapura v. National Sugar Refining Company, 81 N. Y. S. 1085; TELEPHONY, 6-2-88.

Pleading and Practice: Ejectment lies to force vacation of highway—suit in equity not proper.
Little v. Company, 89 N. Y. S. 136.
In Iowa suit may be brought against company in any county through which its lines run.
Franklin v. North Western Telephone Company, 69 Iowa 97; 28 N. W. 461.
Pleading general issue in Tennessee in negligence case.
Cumberland, Etc., Company v. Floyd, 79 S. W. 795.
Agreement that pleading filed on second day of term might be filed as of the first, held void for lack of consideration; return of service good, although defendant incorrectly named—punitive and nominal damages.
Southern Bell Telephone & Telegraph Company v. Earle, 45 S. E. 319.
In New York as to taking appeal.
Miller v. Black River Telephone Company, N. Y. S., American Telephone Journal, 9-6-89.

Poles and Wires: Interference with poles by land owner—company had no authority to place because no injunction could insure against removal.
Heck v. Greenwood Telephone Company, 73 N. E. 960; TELEPHONY, 10-2-175.
Erecting on lands of another without authority—order to remove them.
Purdam v. Cumberland Telephone & Telegraph Company, 87 S. W. 1071; TELEPHONY, 10-3-215.
Erecting on lands of tenants in common under permit in writing from one of co-tenants, valid authority.
Mason v. Postal Telegraph Cable Company, 50 S. E. 782; TELEPHONY, 10-3-215.
License tax on in Pennsylvania—valid where purpose is to raise money for police inspection.
Schellsburg v. Western Union Telegraph Co., 26 Pa. Supreme Court 343; TELEPHONY, 10-6-419.
City's right to move poles in Missouri.
City of Hannibal v. Missouri & Kansas Telephone Company. 31 Mo. App. 23.
Must be sightly and neat.
Forsyth v. Baltimore & Ohio Telephone Company, 12 Mo. App. 494.
Location of, prescribed by commissioners.
American Telephone Journal.
Location of, prescribed by commissioners.
American Telephone & Telegraph Company v. Harbor Creek Twp., 23 Pa. Supreme Court 437.

Village Streets: Use by company.
The use of streets for the erection of a telephone system with permission of village trustees, though without consent of abutting owners, is not unlawful.
Johnson v. New York & Pennsylvania Telephone & Telegraph Company, 78 New York Supplement 598.

Use of Streets for: Distinction between rural highways and city streets—easement greater in latter.
Weeks v. New York & New Jersey Telephone Company, 83 New York Supplement 678.
Location of, must be reasonable.
36 Federal 164.
In highway—regulation of by commissioners—discretion and abuse of.
American Telegraph & Telephone Company v. Harborcreek Township, 23 Pa. Super. Ct. 437; TELEPHONY, 8-1-19.
Not entitled to damages for time lost in trying to get company to remove pole.
Southwestern Telegraph & Telephone Company v. Whiteman, 81 S. W. 76; TELEPHONY, 8-2-122.
Too near highway—injuries—damages.
Alice Wade City & C. C. Telephone Company v. Billingsley, 77 S. W. 255; TELEPHONY, 8-3-226.
When an individual can complain of location of poles.
12 Missouri Appeal 485; TELEPHONY, 8-3-226.
Duty to remove fallen.
West Kentucky Telephone Company v. Phais, 78 S. W. 917; TELEPHONY, 8-3-225.
Colorado companies do not owe linemen duty to inspect.
Kellogg v. Denver Tramway Company, 72 Pac. 609; TELEPHONY, 6-3-161.
Right to place on railroad right of way in Louisiana.
Southwestern Telephone Company v. Kansas City S. & G. Railway Company, 33 South. 910; TELEPHONY, 5-6-336.
Company not an absolute insurer of their safety.
Ward v. Telegraph Company, 1 American Electrical Cases 259.
Duty to inspect rests on company—personal injury.
Cumberland Telephone & Telegraph Company v. Bills, 128 Fed. 272.
Proper location of—must not be in dangerous position.
Alice Wade City, Etc., Company v. Billingsley, 77 S. W. 225.
Right to erect on New York streets.
New Union Telephone Company v. Marsh, 89 N. Y. S. 79; 96 App. Div. 122; TELEPHONY, 9-1-34.

Principal and Agent: Agent of company who collected and presented accounts has authority to bind company by his admissions.
Texas Company v. Prince, 82 S. W. 327.
Who competent to receive service of process.
Southern Bell Company v. Parker, 47 S. E. 194.

Public Policy: Monopoly of telephone business is against public policy.
American Telephone & Telegraph Company v. Morgan County Telephone Company, 36 South. 178; TELEPHONY, 8-2-121.

Rates: Those fixed by ordinance could not be changed by company.
Charles Simons' Sons Company v. Maryland Telephone & Telegraph Company, 57 A. 193; TELEPHONY, 7-6-438.
Authority to fix rates, where it must be found.
TELEPHONY, 9-4-342; St. Louis v. Bell Telephone Company, 96 Mo. 623; Central Union Telephone Company v. Bradbury, 106 Ind. 1; Johnson v. Indiana, 113 Ind. 143; Central Union Telephone Company v. State, 118 Ind. 144.
Right to "control use of streets" and to "license, tax and regulate" telephone companies does not confer power to regulate rates.
2 American Electrical Cases; Joyce, Electric Law, p. 525.
Rates cannot be fixed or passed upon by state court when company is in the hands of a receiver appointed by Federal Court (M.).
Rogers v. Chippewa Circuit Judge, 10 Detroit Legal News 689.
May be regulated by Legislature notwithstanding patented quality of instruments.
Hackett v. State, 105 Ind. 250; Central Company v. Bradbury, 106 Ind. 1; Johnson v. State. 113 Ind. 143; and 118 Ind. 1.
Quality of service maximum rate provided by Legislature requires.
5 N. E. 721; Joyce, Electric Law, p. 523.

Rates: Right to regulate on the part of cities—do as to legislative cases.
American Telephone Journal, 10-20-332.
Franchise prescribed rate, which company tried to raise; held that city had no power to set a price on telephone service.
Marklin v. Findlay Home Telephone Company; American Telephone Journal, 7-24-379.
Adjustment of by Probate Court in Ohio. No contract right, writ of ouster denied.
State v. Toledo Home Company, 74 N. E. 162.
Regulation of by municipalities to be valid must come from Legislature. TELEPHONY, 10-3-215.
Authority to regulate rates of service in Ohio must come from the Legislature.
Farmer & Getz v. Columbiana County Telephone Company, 74 N. E. 1078; TELEPHONY, 10-4-283.

Real Property: Exception or reservation.
Myers v. Bell Telephone Company, 82 N. Y. S. 83.
Telephone system is real property.
Regina v. North Staffordshire Railway Company, 31 El. & Eh. 392; American Union Telephone Company v. Middleton, 80 N. Y. 408; N. Y., Ont. & Wes. Railway Company v. Western Union Company, 36 Hun. (N. Y. 205; Boston Safe Deposit & Trust Company v. Telephone Company, 36 Fed. 288; Western Union Company v. State, 9 Baxt. (Tenn.) 509; Shelbyville Water Company v. People, 140 Ills. 545; Badge Lbr. Company v. Light & Power Company (Kan.), 92 Pac. 476; Frechet v. Drake (Ariz.), 12 Pac. 694.

Right of Way: Grant for, not binding where signature, though genuine, was obtained by misrepresentation.
Wilcox v. American Telephone & Telegraph Company, 68 N. E. 153.

Regulations: Regulation and operation—jurisdiction—obstruction of roads in Kentucky—Circuit Court has jurisdiction over such matters.

Commonwealth v. American Telegraph & Telephone Company, 84 S. W. 519; TELEPHONY, 9-5-422.

Discrimination—punitive damages could not be collected where there was no malice.
Cumberland Telegraph & Telephone Company v. Baker, 37 South. 1012; TELEPHONY, 9-5-422.

Rules and regulations—discrimination—collection of rentals—set off of debt by subscriber not allowed against company.
Irwin v. Rushville Co-operative Telephone Company, 69 N. E. 258; TELEPHONY, 7-4-251.

Jurisdiction of municipality in city streets.
City of Plattsburg v. People's Telephone Company, 88 Mo. App. 306; TELEPHONY, 6-2-89.

When rules are necessary.
Kapella v. Nichols Chemical Company, 82 N. Y. Supp. 477; TELEPHONY, 6-2-89.

Rental could not be collected for time telephone was out of repair, neither could service be discontinued for failure to pay rental.
Mo. State v. Kinloch Telephone Company, 67 S. W. 684.

Authority of subscriber to use extension set.
Gardner v. Providence Telephone Company (R. I.), 49 A. 1004.

Subscriber who offered pay for rental in unpaid labor claims could not complain if telephone was taken out.
Irwin v. Rushville Co-operative Telephone Company, 69 N. E. 258.

Rule of company that it does not deliver messages and that any one who assists in making connections is agent of patron does not relieve company from liability for failure to send messenger.
Central Company v. Swoveland, 14 And. App. 341.

Subscriber who refuses to pay his bill cannot complain if his telephone is taken out.
Telegraph Company v. McGwin, 104 Ind. 130; 2 N. E. 201; Water Company v. Wolfe, 41 S. W. 1040; Frothingham v. Benson, 44 N. Y. S. 879; Brass v. Rathbone, 47 N. E. 905; Rushville Company v. Irwin, 59 N. E. 327.

Rule invalid that company is not liable for mistakes of messengers sent out by it—rule valid that company will not transmit messages beyond telephone station—rule valid that company will not call persons who are an unreasonable distance from telephone station—in toll line business messengers must be employed—duty as common carrier.
Central Union Telephone Company v. Swoveland, 42 N. E. 1035; 6 American Electrical Cases 679.

Rule that service will be discontinued for failure to pay rental is reasonable.
Rushville Co-operative Telephone Company v. Irwin, 59 N. E. 327.

Reasonable regulations in Kentucky.
Williams v. Maysville Telephone Company, 82 S. W. 995; TELEPHONY, 9-2-160.

Company cannot be forced to place telephone in pool room.
TELEPHONY, 9-2-161.

Service: Cannot be compelled to furnish, to house of ill repute.
Godwin v. Carolina Telegraph & Telephone Company (N. C.), 48 S. E. 636; TELEPHONY, 8-6-522.

Duty to furnish messenger service.
Central Union Company v. Swoveland, 42 N. E. 1035; TELEPHONY, 7-6-439.

Companies bound to furnish indiscriminately.
State ex rel. Payne et al. v. Kinloch Telephone Company, 67 S. W. 684; TELEPHONY, 8-2-122.

Wrongful discrimination.
Cumberland Telephone & Telegraph Company v. Hudson (Ky.), 71 S. W. 435; TELEPHONY, 5-3-156.

Service cannot be denied if regulations are complied with.
Mahan v. Michigan Telephone Company, 93 S. W. 629; TELEPHONY, 5-4-212.

No rebate of rental without notice of defective service.
Atlanta Standard Telephone Company v. Porter, 43 S. E. 441; TELEPHONY, 5-4-212.

Duty to furnish compelled by mandamus, notwithstanding a previous debt.
State v. Nebraska Telegraph Company, 22 N. W. 237.

Streets and Highways: Abutting owner could not maintain action for removal of poles in.
Halleran v. Bell Telephone Company, 67 N. E. 1124; TELEPHONY, 8-3-225.

Right to use street in Montana—statutes giving authority.
State ex rel. Rocky Mountain Bell Telephone Company v. Mayor, Etc., Red Lodge et al., 76 Pac. 758; TELEPHONY, 8-1-18.

"Public roads" includes city streets in Iowa.
State v. Nebraska Telephone Company, 103 N. W. 120; TELEPHONY, 10-4-284.

Meaning of public highways in Nebraska.
Nebraska Telephone Company v. Western Independent Company et al., 95 N. W. 18; TELEPHONY, 6-2-87.

Right on highways in New York.
Myers v. Bell Telephone Company, 82 N. Y. 83; TELEPHONY, 6-1-30.

Permit to occupy street not necessary.
Chamberlain v. Iowa Telephone Company, 93 S. W. 596; TELEPHONY, 5-4-212.

Use of village streets by companies.
Johnson v. New York & Pennsylvania Telephone Company, 78 N. Y. Supp. 598.

Rights of abutting owners.
Post v. Hudson River Telephone Company, 78 N. Y. Supp. 76.

Location of poles prescribed by commissioners.
American Telegraph & Telephone Company v. Harbor Creek Township, 23 Pa. Super Ct. 437.

City's right to move poles in Missouri.
City of Hannibal v. Missouri & Kansas Telephone Company, 31 Mo. App. 23.

If in, must be sightly and neat.
Forsyth v. Baltimore & Ohio Telephone Company, 12 Mo. App. 494.

Use of village streets by company—consent of village trustees to erection of telephone system, though without consent of abutting owner, is not unlawful.
Johnson v. New York & Pennsylvania Telephone & Telegraph Company, 78 N. Y. Supp. 598.

Distinction between rural highways and city streets.
Weeks v. New York & New Jersey Telephone Company, 83 N. Y. Supp. 678.

Poles may be erected in streets without consent of adjacent owner.
Magee v. Overshiner, 150 Ind. 127.

Use of, for twenty-one years by telephone company, even though under no franchise gives permanent right therein.
City of Bradford v. New York & Pennsylvania Telephone & Telegraph Company, 56 A. 41.

Charter must confer right in express terms or by necessary implication.
Utica v. Utica Telephone Company, 48 N. Y. Supp. 916.

Poles are an additional burden in Ohio.
Smith v. Cent. Dist. Print. & Teleg. Company, 2 O. Cir. Ct. Rep. 259; 2 Am. Elec. Cases 237, 256; Dailey v. State, 5 Ohio 348; 5 Am. Elec. Cases 187; Joyce, Electric Law, Sec. 304; 1 Am. Elec. Cases 709; 83 N. Y. Supp. 678.

Highway commissioners may fix location of poles in highway and change location when reasonably necessary.
American Telephone & Telegraph Company v. Harborcreek Township, 46 A. 140.

"Public roads" do not include "city streets."
Nebraska Telephone Company v. Weston Indiana, Etc., Company, 95 N. W. 18.

Section of state constitution requiring companies to obtain permission from city councils before erecting lines along city streets is mandatory.
East Tennessee Telephone Company v. Anderson Co. Telephone Company, 74 S. W. 218.

Housemoving an unreasonable use of streets.
98 N. W. 706.

Rights on suburban streets in New York a disputed question.
Weeks v. New York & New Jersey Telephone Company, 83 N. Y. Supp. 678; TELEPHONY, 6-4-244.

Housemoving in,
North Western Telephone Exchange v. Anderson, 98 N. W. 706.

Regulation of use of streets.
City of Wichita v. Missouri & Kansas Telephone Company (Kan.), 78 Pac. 886; TELEPHONY, 9-3-253.

Village streets—use of companies.
Castle v. Telephone Company, 6 New York Supplement, 482; Johnson v. New York & Pennsylvania Telephone Company, 78 New York Supplement, 598.

Agreement to pay per cent of gross earnings for privilege of occupying streets is binding in Missouri.
City of California v. Princeton Telephone Company, 87 S. W. 604; TELEPHONY, 10-5-353.

Statutes and Construction of Statutes: Failure to comply with provisions of statutes.
Cumberland Telephone & Telegraph Company v. Morgan's Louisiana & Texas R. & S. S. Company, 36 South. 352; TELEPHONY, 8-2-122.

Construction of: "Act providing for the *formation* of telephone companies"—meaning of formation.
City of Wichita v. Missouri & Kansas Telephone Company (Kan.), 78 Pac. 886; TELEPHONY, 9-3-253.

Subways: Location of subways by board of public works not conclusive.
Western Union Telegraph Company v. Syracuse, 53 N. Y. Supp. 690.
Had no exclusive right to.
Empire Subway Company v. Broadway Company, 33 N. Y. Supp. 1055.

Taxation: Revenue tax on messages.
New York Telephone Company v. Treat, 130 Fed. 340; TELEPHONY, 8-3-225.
Under state laws when company existed under franchise of federal government.
Western Union Telegraph Company v. State of Missouri ex rel. Collector of Jackson County, 23 Supreme Court Reporter 730; TELEPHONY, 8-5-409.
License tax, when valid.
Postal Telegraph Cable Company v. Borough of New Hope, 191 U. S. 204; do v. Borough of Taylor, 191 U. S. 204; TELEPHONY, 7-4-248.
When license fees are legal.
Sunset Telephone & Telegraph Company v. City of Medford et al., 115 Fed. 202; TELEPHONY, 7-5-354.
Shares of stock, not tangible personal property, taxable in Iowa.
Layman v. Iowa Telephone Company, 99 N. W. 205; TELEPHONY, 8-1-19.
Assessment of omitted property.
Parkinson et al. v. Jasper County Telephone Company, 67 N. W. 471; TELEPHONY, 6-2-87.
Instruments used in interstate commerce not taxable.
State v. Rocky Mountain Bell Telephone Company, 71 Pac. 311; TELEPHONY, 5-4-212.
War revenue tax construed.
New York Telephone Company v. Treat, 130 Fed. 340.
Of tangible telephone property in Nebraska not unconstitutional as being in violation of interstate commerce.
97 N. W. 1063.
Iowa telephone tax law invalid.
Layman v. Iowa Telephone Company, 99 N. W. 205.
Reasonableness of tax on poles.
Postal Telegraph Company v. New Hope; do v. Taylor 5 Advance Opinion U. S. Supreme Court 205.
Power to reassess omitted property.
Parkinson v. Jasper County Telephone Company, 67 N. E. 471.
Realty on which exchange building stood was used in ordinary course of business and hence was taxable by state board.
New England Telephone & Telegraph Company v. City of Manchester, 55 A. 188.
License fee could not be imposed on company which had previously received a franchise from proper authority.
21 N. W. 828.
License tax on each pole declared valid.
St. Louis v. Western Union Telegraph Company, 148 U. S. 92; do 149 U. S. 465.
License fees for use of streets—true test of validity of.
City of Fort Smith v. Hunt, 82 S. W. 163; TELEPHONY, 8-4-328.
Tax of $1 on every pole is valid.
St. Louis v. Western Union Telegraph Company, 148 United States, 92; 149 Iowa 465.

"Telegraph" includes "Telephone": Cases holding the affirmative of the above proposition:
State v. Central N. J. Telephone Company, 53 N. J. L. 341; Attorney General v. Edison Telephone Company, 6 Q. B. D. 244; Wisconsin Telephone Company v. City of Oshkosh, 62 Wis. 32; Chesapeake & Potomac Telegraph Company v. Baltimore & Ohio Company, 66 Md. 339; York Telephone Company v. Keesey, 5 Pa. Dist. R. 366; Franklin v. N. W. Telephone Company, 69 Iowa 9; Central Pennsylvania Telephone Company v. Wilkesbarre & U. S. Railway, 11 Pa. C. & R. 417; TELEPHONY, 9-2-159.

Trees: Trimming of, in Michigan—companies have authority to do so to admit of free passage of wires.
Wyant v. Central Telephone Company, 123 M. 51; TELEPHONY, 8-6-521.
No previous notice to owner necessary before trimming.
123 M. 51.
Damages for injury to shade trees.
South Western Telegraph & Telephone Company v. Branham; TELEPHONY, 6-2-89.
No authority to cut shade trees without permission of owner.
McAntire v. Joplin Telephone Company, 75 Mo. App. 535; 1 Mo. App. Rep. 420; Brownson v. Albion Telephone Company (Neb.), 60 L. R. A. 426; Joyce, Electric Law, p. 390.
May be trimmed in a reasonable manner.
Meyer v. Standard Telephone Company (Iowa), 98 N. W. 300.
Trimming trees held lawful.
Southern Bell Telephone & Telegraph Company. 69 Fed. 61.
Franchise gave no right to trim trees on private property.
South Western Telephone & Telegraph Company v. Branham (Tex.), 57 Am. Rep. 237.
Held that company was liable even for necessary injuries to.
Bronson v. Albion Telephone Company (Neb.), 60 L. R. A. 426.

Tresspass: Damages for willful.
Jones v. Cumberland Telephone & Telegraph Company, 80 S. W. 165.
Damages.
For trespass in locating telephone pole in front of premises,
South Western Telegraph & Telephone Company v. Whiteman, 81 S. W. 76.
Attaching wires to roof of building without permission—reasonable rental value may be recovered.
Burke v. New York Telephone Company, 91 N. Y. Supp. 390; TELEPHONY, 10-1-72.
Punitive damages for.
Jones v. Cumberland Telephone & Telegraph Co. (Ky.), 80 S. W. 165.

Wires: Cutting of, by house mover.
Northwestern Telephone Exchange Company v. Anderson; TELEPHONY, 7-5-354.
Guy wires—when necessary (Ill.).
Cumberland Telephone & Telegraph Company v. Coats, 100 Ill. App. 519; TELEPHONY, 6-2-89.
Location of wires in Minnesota.
Northwestern Telephone Exchange v. Twin City Telephone Company; TELEPHONY, 6-2-88.
Removal of by authorities—no such right in absence of interference.
American Union Telegraph Company v. Harrison, 1 American Electrical Case 291.
Conversion of—company liable for acts of linemen when.
Electric Power Company v. Company, 43 N. E. 986; 148 N. Y. 741.
House mover negligent—liability for leaving wires in dangerous place.
Nagle v. Hake, 101 N. Y. 409; TELEPHONY, 9-2-160.
Interference by house mover.
Query, answer and citations.
American Telephone Journal, 10-26-434.
Cutting of wires to allow moving of buildings in Massachusetts. Liability of parties.
Richards v. Boston Electric Light Company, 74 N. E. 350; TELEPHONY, 10-2-174.

THE NICKEL TELEPHONE.

It may be a convenience
The nickel telephone,
But indignation most intense
It rouses, we must own.
Its everlasting ringing serves
To quite unhinge my ragged nerves.
I cannot really quite divine
Why people use a party line.

Although my call's a single ring,
It seems to be my fate
That, as an ordinary thing,
It sounds from two to eight.
It keeps me jumping all the while;
It maddens me; it stirs my bile.
I always think the call is mine
I hear upon the party line.

And if I do not answer straight
At once they're sure to quit,
And that "the party wouldn't wait"
I don't believe a bit.
But when the others get a call
You bet there's no let-up at all.
Of all my troubles, I opine,
The worst one is the party line

—The Chicago News.

TELEPHONE INVESTMENTS, AND OTHERS

The Financial Side of Independent Telephony

By Frederick S. Dickson

A BOOK on "Telephone Investments and Others," written by Frederick S. Dickson, president of the Cuyahoga Telephone Company of Cleveland, Ohio, recently issued, has been exciting considerable comment in financial circles and among business men who have read it. It is a strong and able presentation on the subject of telephone investments as compared with other investments.

A synopsis of the chief points made by Mr. Dickson in his book with some extracts from the same will prove of interest.

Mr. Dickson admits that considerable conservatism has existed as to investments in telephone property. The same doubts existed ten years ago as to traction lines. He says: "First mortgage bonds on these roads could hardly be sold at 60 cents on the dollar and nobody wanted the stocks at any time. Now the bonds of many of these roads are selling above par and the stocks are paying handsome dividends. Back in the fifties, a man who invested in steam railroads did so largely from philanthropic motives for the benefit of his town or state. The descendants of those who bought then and kept them are the multimillionaires of today. Only the far-seeing few discriminate between the good and the bad and buy what the many reject."

The author divides the various securities of stocks and bonds into (1) government, (2) real estate, (3) banks or trust companies, (4) industrials, (5) mining and (6) public service. Government bonds, on account of the small revenue they produce, are practically taken out of consideration. Conditions may change in real estate, usually regarded the most staple investment, so as to depreciate value quickly. An instance which he names is that in 1880 the property at the northeast corner of Superior and Water streets, then the financial center of Cleveland, Ohio, was assessed at $93,490.00; in 1901 this property was assessed at $48,940.00, a decrease of 55 per cent. Stocks in banks and trust companies, when unsold, are generally absorbed by directors or other friends who may be willing to take a low rate of interest. The Guardian Trust Company pays 6 per cent. on par and the last sale was at 255; so the investor will get a little more than 2 1-3 per cent. on his money. The R. G. Dun Company reports the failure of 107 banking and trust companies in the United States in 1904, having liabilities of $25,374,911. Not an Independent telephone company is reported to have failed that year. "It would take a bad manager a couple of years to ruin a telephone company, but he could ruin a bank in twenty-four hours. The Cuyahoga Telephone Company, under conservative management, scarcely invests a dollar in development that does not earn money before the bills for material or labor are due. This is another advantage which the telephone company has over the bank."

Industrial securities are founded upon manufacturing establishments. The earning power of plants and market value of their securities fluctuate greatly. All classes of business are quickly affected by hard times except companies supplying water and communication. The stability of the income of these latter is based upon their annual contracts with customers.

"If business be good, talk makes it better; if it be bad, does it not take talk to renew a note? The telephone company does not make things to sell, carries no large stock of goods, nor does it need to hold idle vast quantities of raw material. It simply sells service, and all this property is used to make that service effective. A manufacturing company is not only compelled to repair heavy losses from friction, but it is forced from time to time to reconstruct its plant, owing to a change in demand of the goods it makes."

Mining is too speculative, he says, to be an inducement to the general investor. While the water company compares better with the telephone company than any other public service corporation, depreciation of the investment owing to rust and friction is great.

Nearly the total of a railroad investment is subject to depreciation by "wear and tear." Less than 15 per cent. of the telephone plant is subject to friction. A $6.00 pole may withstand a flood which carries away a $60,000 bridge. Much of the damage of sleet storms has been avoided by combining wires in a single aerial cable strung low. The New York tunnel collision cost the railroad more than a million dollars. The Cuyahoga Telephone Company paid, from January 1, 1901, to May 31, 1905, four years and five months, for damages and accidents, only $1,449, about ¾ of a mill for each $100 of gross earnings. During the formative period in telephone development considerable change in apparatus was required. Most of such equipment now in use has apparently reached its highest development.

Railroad lines, pioneers of development, cannot at first earn operating expenses. A telephone system is begun only when the population demands it, and extended with the demands of its customers. It earns money before its bills are payable. A lease of telephone wires for telegraph purposes is a valuable by-product.

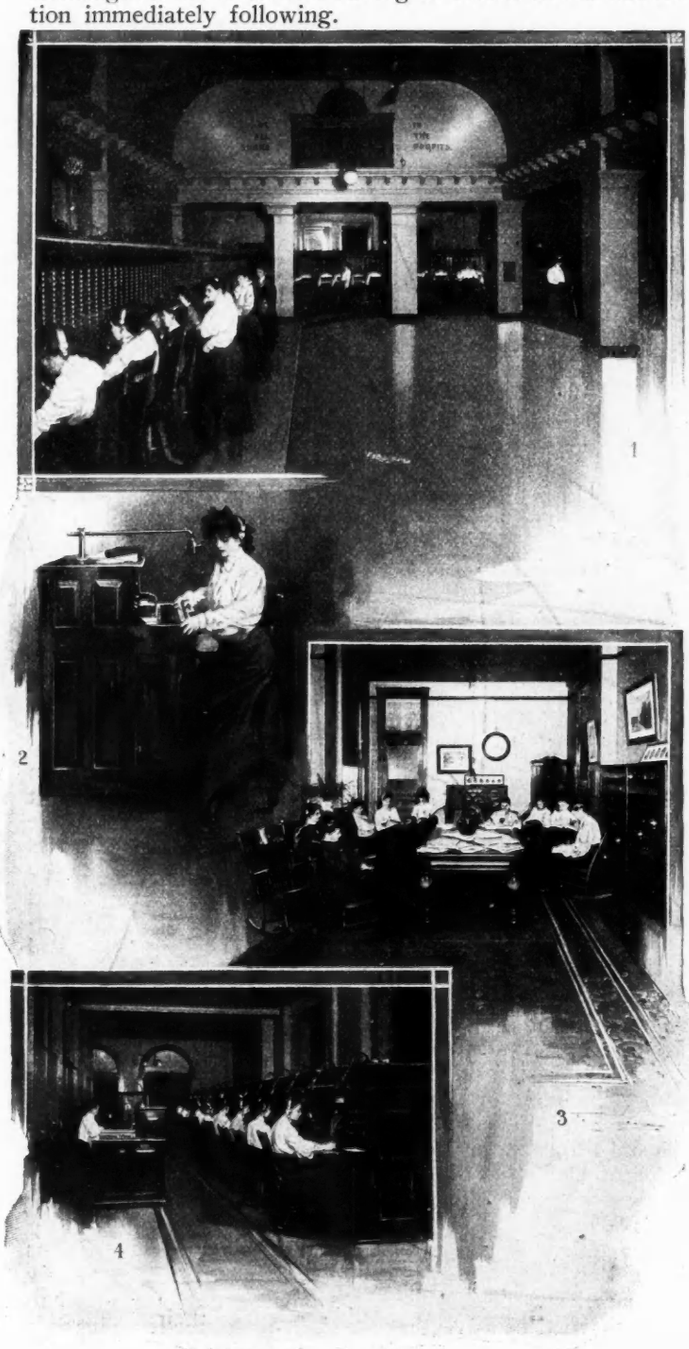
These questions must be considered as to an investment: 1. Is there business value now? 2. Will this increase or decrease? 3. Will competition destroy values? 4. Will the business realize the property above fixed charges? 5. Is the business conducted properly and profitably? The question is sometimes asked: "What is the junk value of a telephone company?" $1,600 a mile would be a low estimate for the average cost of a railroad right of way 60 feet wide in Ohio. The cost of a telephone right of way is trifling. The railroad right of way, if abandoned, would usually be useless for farming purposes.

Though millions of dollars are now expended to produce electric lights, the earnings of gas properties are greater than ever. There is more light. The public has been benefited by competition in telephones. This competition ought also to benefit the company giving the best service. Ninety-eight per cent. of long distance calls are for points within a radius of 100 miles. Selective party lines, where only one bell rings, are profitable to the company and cheap to the user. We run a risk on making deposits in the banks or investing in any form that there may be no increase or even that we do not get back the principal. The risks of telephone investment are small in comparison with those of other businesses. Sharing in general prosperity, this business suffers less than others when hard times come, as it supplies a necessity. Much of its property may be shifted to meet changing public needs. The business embraces more advantageous elements than any other. For a long time it was a monopoly in the hands of greedy men, who refused to reconstruct obsolete plants, reduce excessive rates, or develop their property until forced by competition. Business men all over the country united and established competing plants. The Bell company charged $120 a year in Cleveland before competition for some of their telephones and gave a total of only 4,200 possible connections. This was at a rate of more than 3 cents a year for each possible connection. Now they have nearly 20,000 and their highest rate is $84 a year, a rate of 4.2 cents for each available tele-

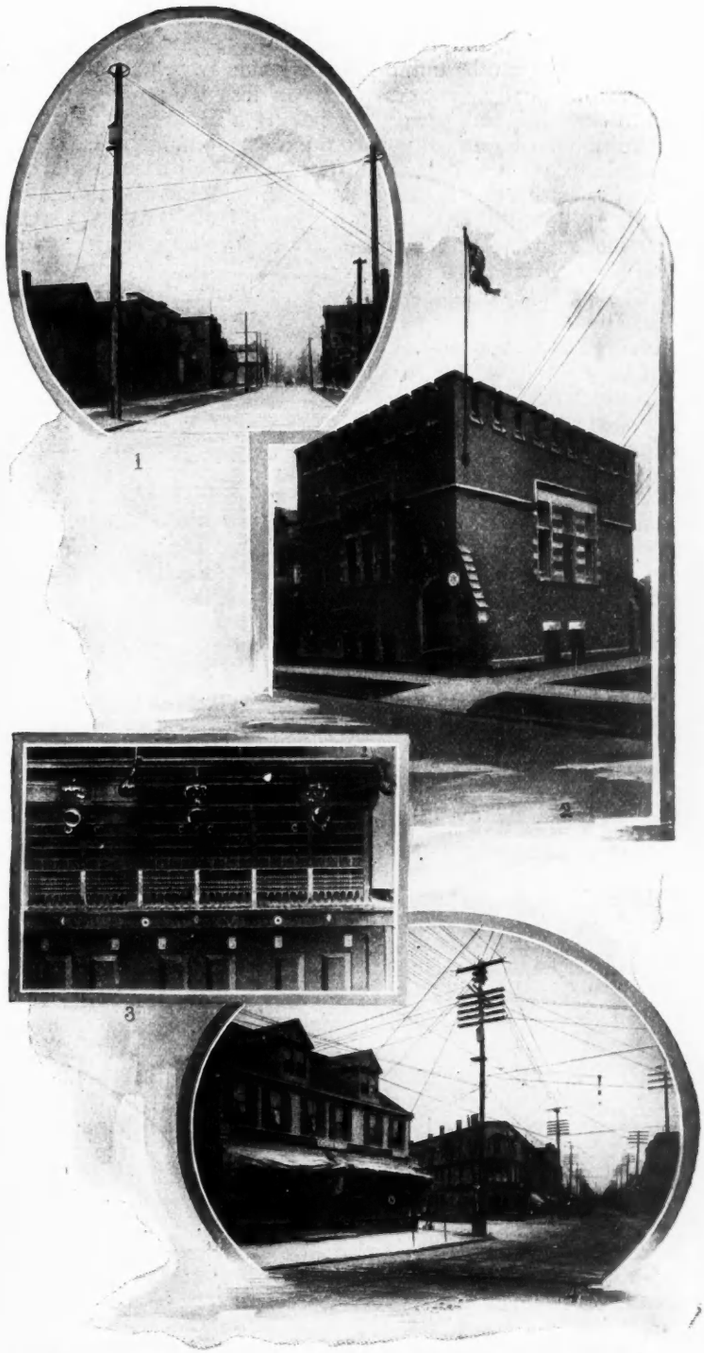
phone. The highest rate of the Cuyahoga Telephone Company, with 18,500 telephones, is $72 per year, a rate of a little more than 3.8 cents a year for each available telephone. If you take both you pay 8 mills, or about one-half of what you formerly did for one.

We reproduce in full the last two chapters of Mr. Dickson's book because one of them refers to the illustrations of the Cuyahoga Telephone Company's plant, cuts of which illustrate this review, and the other is a general summing up of the entire book. The chapters follow:

Is the Business Conducted Properly and Profitably? Possibly this question has been answered by all that has gone before, but nevertheless we would tell you something of the nature of our work, so that you may understand its limitations and your own also. The switchboard in our central exchange in the Electric Building is shown in the illustration immediately following.



Central Switchboard
A Private Switchboard
Long-Distance Switchboard
The Operators' Resting Room



Distributing Pole.
A Section of Switch at "Crest."
"Crest" Building in East Cleveland.
Pole Construction.

Before each operator there are 160 little round openings called jacks, with a tiny electric lamp above each. When the receiver is taken off the telephone, one of these lamps is lit. The operator immediately puts a plug attached to a cord into the jack indicated, and that gives her communication with the caller. The moment she gets the number wanted, she puts a second plug in the jack corresponding to that number and the connection is complete. When the conversation is finished and the receiver hung up, a second lamp on the board is lit, and the operator takes out both plugs, and the cords drop back into their places. An operator, therefore, must take care of 160 callers, and she can connect the caller with 8,080 main line telephones, for there are now that many jacks within reach of her arm.

As the business grows the number of jacks will increase, and when the board is full 18,000 jacks can be reached by

each operator. There are fifteen pairs of these cords before each operator, and there are to-day 54 positions, so that 1,620 people can be talking through this switch at once. An operator usually answers a call in less than five seconds. Allowing the same period for making a connection, it would take about two and one-half minutes to enable these 1,620 people to get into communication with each other. During the busiest part of the day some operators answer about 300 calls an hour; that is five for every minute. And yet some people seem to think that the operators entertain themselves with fancy work between calls.

To enable each operator to furnish connections with every telephone on the board requires a vast amount of careful wiring, and it would interest the reader to see the back of the switchboard, showing the piles of cables necessary to do this work. Each little cable contains forty-two insulated copper wires, forty of which are in use and two are reserved for emergencies. Each wire is covered with party-colored wrappings, so that in making repairs any of these wires may be identified. These wires are scarcely thicker than a small pin. In the central switchboard there are 1,275 miles of wire, enough to reach from Cleveland to Denver, Colorado.

The switchboard now in use cannot well be improved upon, as far as the quality of the service is concerned. It is as speedy as mechanical skill can well make it and it is not likely to be improved upon, excepting in the direction of reducing the cost of operating.

Very often, when the operator attempts to put the plug in the jack, she hears a little click. That means that the party wanted is talking to someone else and so she drops the plug and says "Line's busy." You see it is really much less work for the operator to make the connection than not to do so, and yet the impatient subscriber often insists that "the operator is just too lazy to give the connection wanted." So we like to have our subscribers call and look at the way these faithful operators are doing their work. After the exchange is once looked at, the subscribers and all of us are better satisfied. Sometimes the delay in making a connection is caused by the carelessness of the user. A certain person is wanted at the telephone and the receiver is left off the hook while he is being searched for, and then the whole matter is forgotten and the receiver is left off indefinitely. As I write I have just called up the chief operator at our central exchange and she informs me that forty-three receivers have been left off the hooks to-day and that is about the usual average, so all these forty-three careless people have wasted their telephone opportunities and their telephones must be reported "busy" until they see fit to hang up the receiver, and maybe ten times forty-three other subscribers are complaining of the bad service of the company because they cannot get the people they want. This is one of our troubles, and yours, too, and you alone can correct it.

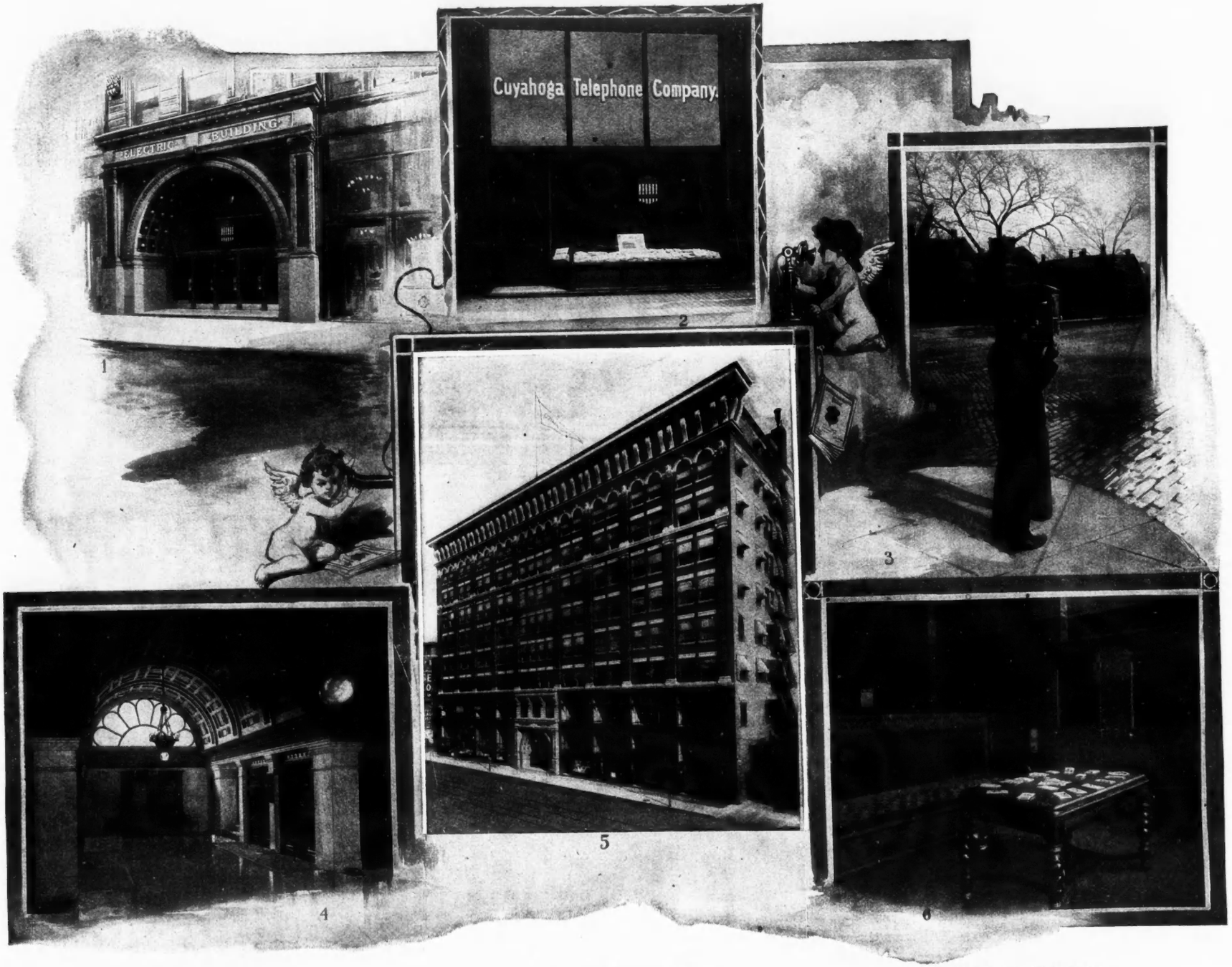
Some railroads keep their property in good condition and some do not. The cost of proper maintenance is very great, while failure to make repairs is even more expensive. Flat wheels cause a waste of power, heavy wear on the rails, and the recurring jar wrecks the body of the car. A poorly maintained railroad may mean bad service to the public, while a telephone property not properly maintained means no service at all. If a telephone company is to do business it must be maintained in a state of the highest efficiency all the time. Heavy charges have got to be met for the maintenance of a railroad, for it is constantly being rebuilt, but the depreciation of a well constructed telephone plant is very small. Properly taken care of, it does not depreciate. The Bell people deny this proposition and it is doubtless true from their point of view, because a large proportion of their plants are not properly constructed. The apparatus in use before 1890 is almost all of it antiquated and worse than useless and therefore the Bell people are obliged to set up yearly a large sum for depreciation because much costly apparatus must be consigned to the junk heap as fast as modern equipment can be gotten to take its place. This charge does not apply to most of the so-called Independent plants which, like the Cuyahoga Telephone Company, have been built within the last few years and most of their apparatus cannot well be improved upon.

We have shown you our plant and you can see value there. We have shown your our business and you can see how it has increased in the near past, up almost to the very day on which these lines are penned. You know the result of competition in Cleveland and how it has benefited the public and done no harm to the Cuyahoga Telephone Company. Our earnings and expenses prove the profitable nature of our enterprise. You know from all this whether the business is being conducted wisely or not, so we say to the investing public, "Here are these securities for your consideration. Look at them again the light of what we have told you, in the light of what we have done, are doing, and propose in the future to do."

We have pointed out the manifold risks in many business enterprises, not to expose the weakness of these different forms of investment, but rather that we might demonstrate the strength of telephone securities. We all know that when we lend to others, and that is what we do when we invest or even when we deposit our money in the bank, we run a risk that we will not get back our principal, and more risk still that it will not be increased by interest or dividends. We find that in every kind of investment there is some risk, and to the surprise of many of us we find that a telephone company is wholly free from some of the commoner and more trying forms of risk, and that the risks that it does run are mild and unimportant in comparison with the risks that threaten profits in other lines of business.

Now doubtless most of our readers are also surprised when told of the many marked advantages which the telephone business has over other methods of making money. Let us recapitulate some of the more marked of these. A telephone company shares in general prosperity and reaps an advantage in the average increase in values, and yet it suffers less than others when hard times come. It supplies a necessity of life. Its income is stable and not fluctuating, and the number of its telephones may increase largely and steadily. It does not have to remove its exchange because of a change in the business center of a city. It is easy for it to extend its cables to supply increased demands. A large proportion of its property may be economically shifted to meet varying public needs, and new lines begin to earn money before the bills for labor and material are due. It does not make things to sell and therefore carries no large stock of goods, nor does it need to hold idle vast quantities of raw material. While the junk value of its plant is very high there is little likelihood of its property ever being sold as junk. Its loss from friction need not be taken into account, from weather conditions is ordinarily slight, and from accidents infinitesimal. Properly maintained its depreciation from natural causes is but little, and from the changing character of business far less than for a manufacturing or transportation company. It offers good rates for its bonds and promises with reasonable certainty handsome dividends on its stocks. An incompetent manager cannot injure its business easily or permanently. Few Independent telephone companies have ever failed and all have a profitable by-product as yet undeveloped in using the wires for telegraphing, messenger service, or burglar or fire alarm.

Here, then, is a business favored by natural conditions beyond compare, embracing almost every element necessary to compel success, and why then has it thus far failed to prove beyond peradventure its right to succeed? This is a fair question and one which every reader must inevitably ask, and it deserves and will receive a frank answer. You see, we wish to be understood, not only at the beginning of



Entrance to Electric Building.
Lobby of Electric Building.

Contract Department Offices.
Electric Building.

A Street Corner Telephone.
In Contract Department.

our argument, but at its ending. We would be frank to all, even at the risk of being annoying to some.

First of all, while there never yet was a business embracing more advantageous elements, still there never yet was a business that had been so signally mismanaged for so great a length of time. It was founded by very small men, of very great greed. They could see nothing but a monopoly which they believed might be made perpetual upon their own harsh terms. It might have been made perpetual based upon reasonable rates for generous service, but no body of men ever yet retained control of a business founded upon extortionate rates for inefficient and limited service.

So with the expiration of patents came opposition, for to the end, yes, till to-day, the Bell people have refused to reconstruct obsolete plants, to reduce exorbitant rates, to extend or develop their properties or to give good service until forced thereto by competition. Business men, therefore, all over the country banded themselves together and established competing telephone plants, often without any thought of profit from the enterprise, but simply that they might obtain the adequate telephone facilities which the old company flatly refused to furnish.

Take Cleveland as an example. Before competition the Bell company was charging $120 a year for some of their telephones and giving a total of only 4,200 possible connections. That was at the rate of more than three cents a year for each possible connection. To-day they have nearly 20,000 and their highest rate is $84 a year. That is at the rate of 4.2 mills for each available telephone. The Cuyahoga Telephone Company has to-day a little more than 18,500 telephones and their highest rate is $72 a year. That is at the rate of a little more than 3.8 mills a year for each available telephone. Take both together and you pay eight mills for what formerly cost you nearly four times as much.

Take Lorain as an example. This thriving city had no telephone exchange at all and her business men humbly petitioned the Bell people to give them one. They were curtly answered "No, your town is too insignificant for us to consider." When the patent rights expired the Lorain people built an exchange of their own and then again they prostrated themselves before their masters and implored long-distance connection. The Bell people had their wires already in the town, it would have cost them nothing to comply, and they would gain trade by doing so, but the petitioners were dismissed and told that the Bell people could not even acknowledge that they existed, and so Lorain manfully built her own lines to outlying towns when she could, and thus the Independent long-distance business had its birth in the luxuriant fatuity of the Bell people.

Remember, too, this occurred in Ohio, not Finland. These were American business men that talked and acted thus, not grand dukes.

So opposition came and grew into the huge thing it is to-day. The Bell people had to meet it. How did they do this? By reducing rates to reasonable figures? By improving service and manners? By extending telephone facilities where demanded? By doing their work better than anybody else could do it? No! Never! excepting only where competition came or threatened, and then grudgingly, and therefore ineffectually. Always too late they did these things, when the doing availed nothing. When they saw their exchanges almost deserted they offered their telephones for nothing, if the customer would but agree to throw out the opposition instrument, and the people laughed at them. I am told that they are doing this same thing now, here in Cleveland, and again the people laugh and refuse their offer.

But there was another very important element in the situation. All over the country the people who planned these opposition telephone exchanges calculated that they might be able to get double the amount of business the Bell was then doing, so the capital contributed was limited to a certain easily ascertained cost, and the rates were made to supply a definite and fixed amount of service. But lo! No sooner had they begun work than the people, who had been hungering for efficient service, swarmed in crowds upon the new exchange and demanded telephones. At once these telephone people found their capital exhausted and the demands for further development incessant. Instead of meeting this natural and advantageous demand for further extension by at once increasing their capital and also increasing the rates in accordance with the increase of service, nearly all of these corporations hesitated and temporized. They borrowed, and thus ran into debt. They used their earnings to pay for telephones and had nothing left for dividends, and again had to borrow to pay interest on their bonds, and thus they impaired their credit amongst their own people. Again, they had told the people that the business could be done profitably at certain rates, and they hesitated to increase these rates, although the service was double or quadruple what they had promised.

The Bell people were quick to take advantage of this situation, not directly, but indirectly; not frankly, but by the back door. Their literary bureaus attacked persistently the value of telephone securities, criticizing one company after another, and getting the matter printed as news in divers papers at advertising rates. Then the first article would be reprinted in another paper and credited, never to the telephone company, but always to the other newspaper. The attacks were published in far-off places to frighten investors in towns where an opposition company was springing into life. The Cuyahoga Telephone Company has never been attacked in Cleveland, but in Bangor, Maine, pamphlets criticizing it unfavorably have been distributed in the doorways by the hundreds. Its soundness has been questioned in Kentucky, in Tennessee, in Iowa, in California and I know not where else besides. Only the other day a telegram from Boston was solemnly read before a committee of council in San Francisco, whose duty it was to pass upon a proposed opposition telephone franchise, and the telegram asserted that the Cuyahoga Telephone Company was about to pass into the hands of a receiver. How strange, to go to Boston for information about Cleveland. Cleveland's answer to Boston's news must have convinced the city fathers of San Francisco that all the people in both the towns could not be truthful.

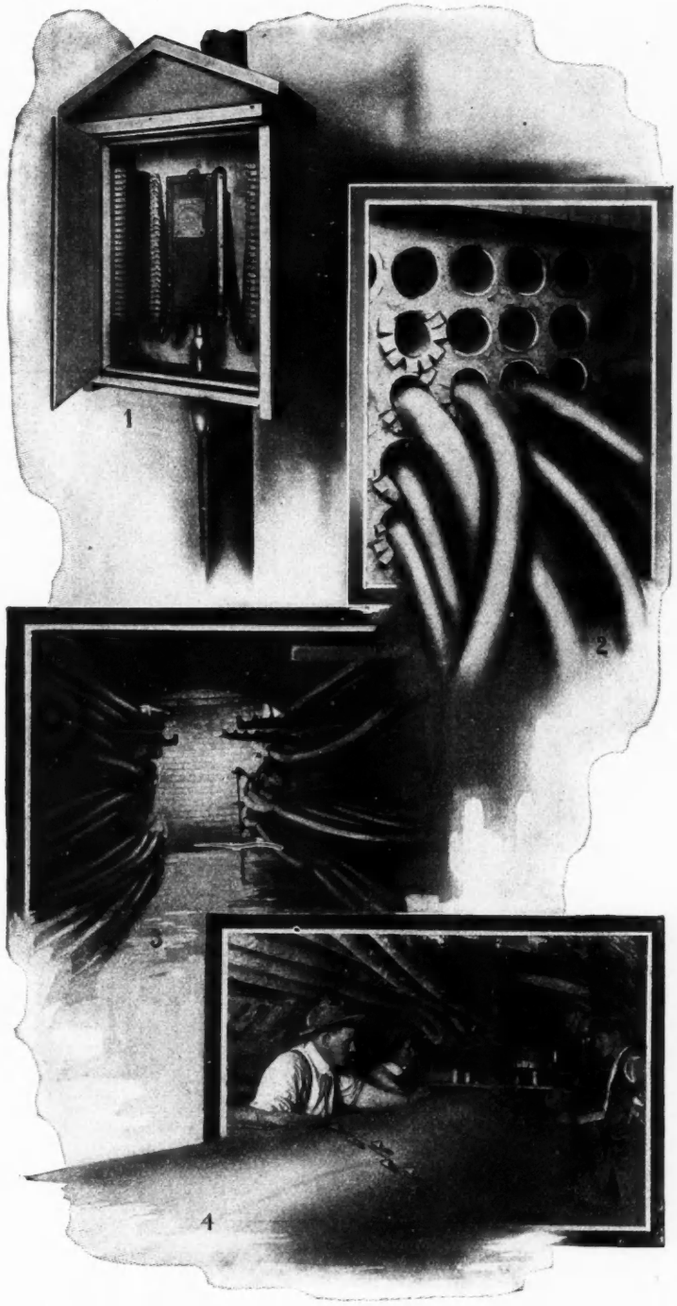
Is this fair competition? Is it good business? Can it succeed when the people realize the truth? In a measure it has succeeded thus far. It has contracted the market for Independent telephone securities and at the same time it has made the stock of the American Telephone and Telegraph Company, which sold as high as 185⅜ in 1902, sell as low as 114½ in 1903. Thus far in 1905 its highest price is 148, a reduction of 37⅜ dollars a share from the highest price in 1902. That means that these people have actually sacrificed the enormous sum of $49,225,850 in the value of their own stockholders' property in a frantic effort to discredit telephone securities as an investment. Oh, the folly of it! Add to this, if you will, fifty millions more from the shrinkage in value of the stocks and bonds of the various corporations subsidiary to the parent Bell and you will get some idea of the colossal price which Bell investors have been compelled to pay for the bungling incapacity of their officers. And, after all, of what avail is all this wanton sacrifice?

If telephoning as a business were actually unprofitable, such tactics might ultimately prevail, but the contrary being true, these unwise efforts must in the end disastrously affect only those responsible therefor.

The only obstacle to-day to the unlimited success of the telephone business is the difficulty of getting additional capital for development at reasonable rates of interest. Actually, its only obstacle is the greatest virtue any business can have—its marvelous growth. When the world learns the truth of this the only obstacle will be already removed.

Whenever we come to speculate upon what will be, we must be guided largely by what has been. Nature might have made water run up hill instead of down, but as it has invariably run down hill in the past we believe it always will run down. The wisest man is the one who sees furthest ahead, who buys now what people are going to want later. These are the successful ones. The few buy things when they are cheap. The many wait until they are dear. When a few Cuyahoga telephone bonds were offered by weak holders at 60, not so long ago, few would buy. At 80 the demand was steady. At 90 there will be more buyers than sellers. At par they will be taken eagerly. This is what the past teaches us, and it is as certain as that water runs down hill.

We earnestly recommend Mr. Dickson's book to the consideration of telephone men and investors, believing its careful perusal will be of interest and benefit.



Distributing Terminal Box on Pole. Underground Conduits and Cables.

In a "Man Hole." Under the River.

Wire Chiefs Testing for Trouble (This is "Central 77").
Terminal Room.
Storage Batteries.

Some of the principal illustrations used in the book are herewith reproduced and show the Cuyahoga Telephone Company's main switchboard; a private branch exchange switchboard; long-distance switchboard; operators' resting room; one of the main distributing poles; section of switchboard at "Crest"; "Crest" building in East Cleveland; a specimen of pole line construction; entrance to electric building; lobby of electric building; offices of the contract department; the electric building proper; a street corner telephone; a view in the contract department; a distributing terminal box on pole; a view of underground conduits and cable; a section of a manhole; a view under the river; wire chiefs testing for trouble; terminal room and the storage battery rooms.

The reception of Mr. Dickson's book has been very flattering.

DIGEST OF TELEPHONE PATENTS

By Edward E. Clement

804,819. Signaling System; J. E. Allison. A system for use on electric railways and the like in which telephones can be located along with semaphore signals at intervals on the line, and any one of these signals selected and set by magnetically controlled mechanism so as to notify any car on the line that the Train Dispatcher wants to talk. An answer-back signal is given the calling office when the semaphore arm is set. Patent assigned to George M. Seeley, New York, N. Y.

804,820. Signaling System; J. E. Allison. This is an improvement on the previous system, means being added whereby any one of the signals can be selected and set or restored, or all of them can be set and restored. Patent assigned to same party.

804,848. Telephone Signal System; A. R. Hoover. A party-line scheme without any central. The invention resides particularly in the construction and connections of the bells, using a closed bell line circuit, and normally open signal bell circuits. A limited number of instruments may be called by code signals only relays being in the line. One-half interest assigned to C. J. Craigmiles, Pleasant Hill, Ill.

804,861. Multiple Switchboard for Telephone Exchanges; M. G. Kellogg. This is one of the few remaining patents in the large batch thrown out by the Patent Office in 1897 to the Kellogg company. The subscriber rings in over a metallic circuit, and is called over the ground, as well as clearing out over the same by hanging up and grounding his generator. Patent assigned to The Kellogg Switchboard & Supply Company.

804,862. Telephone Exchange System; M. G. Kellogg. This patent is not assigned to anyone, although it belongs to the same group. It relates to divided multiple switchboards, and has fourteen claims, some of which are drawn to the arrangement of call generators, calling and clearing out signals.

804,940. Electric Switch or Disconnecting Device for Telephones; L. J. Fletchall. This is a switch on the outside of a house with a cord running over pulleys and leading into a hole in the wall so that by pulling the cord on the inside and fastening it when pulled, the telephone can be disconnected on the outside. One-half interest assigned to Mark L. Belden, Hatfield, Mo.

805,057. Ringing Key; E. B. Craft. A key having a pair of cams mounted tandem on the same plate with a cam between them pivoted so that the rocking of either key will restore the other one to its normal position. The keys work contact springs in approved fashion. Patent assigned to Western Electric Company, Chicago, Ill.

805,092. Electric Transmitter; J. Prince. A granular transmitter of the solid back type having a fixed back electrode, in shape of a carbon cup, containing granulated copper, zinc and magnetic ore. A cover disc on the diaphragm is made of gun cotton, and inside of it is an electrode composed of copper, zinc and carbon plates. This transmitter looks as if it was loaded, and I suspect some time it will make a noise in the world. A life insurance policy ought to go with it. Parts assigned to Charles E. Aldrich and John H. MacDonald, Beverly, Mass.

805,126. Multiple Station Telephone System; A. J. Farmer. This is a party-line system wherein a line runs out from central to a so-called junction box, from which individual lines run to the several stations. A step-by-step switch and a magnet in the junction box can be worked from central to connect any one of the stations. Patent unassigned.

805,154. Fuse Terminal; H. E. Procunier. A cable box or head with fuse studs mounted on the outside of it having insulating sleeves and conducting plates to hold the high potential carbon plate. Patent unassigned.

805,557. Electric Current Generator; W. Kaisling. A magnetor generator having a commutator so that it can furnish combinations of alternating, pulsating or direct current. Patent assigned to Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y.

805,619. Electric Signaling System; W. S. & A. S. Aungst. A scheme for sending fire alarms over telephone circuits, plugging the same at central onto fire alarm receiving circuits. The system is said to be working in Alliance, Ohio, where Mr. Aungst is or was the Fire Chief.

805,901. Telephone Exchange System; H. T. Cedergren. A common battery exchange system with the battery bridge between inductive resistances whose characteristic feature is stated as follows:

"The inductive resistances are so located, and the spring-jacks and cord, * * * that the continuous current from the central battery does not find any closed circuit through any part of the jack field." In plain English, the battery is connected to the lines permanently through the two halves of the secondaries of repeating coils, the primaries of which go to the spring-jacks. Patent unassigned.

806,284. Mouth-Piece Attachment for Telephones; M. F. H. Phillips and W. B. Hubbard. A round card to go over the mouth-piece and a metal ring with fingers to bend down to hold it. Patent unassigned.

806,339. Telephone Shelf; J. S. Gold. A shelf applicable to wall sets comprising a long board mounted crosswise with a notch in which you can leave the receiver, clamps to hold it fast, and a pad holder mounted on the right-hand end. Patent unassigned.

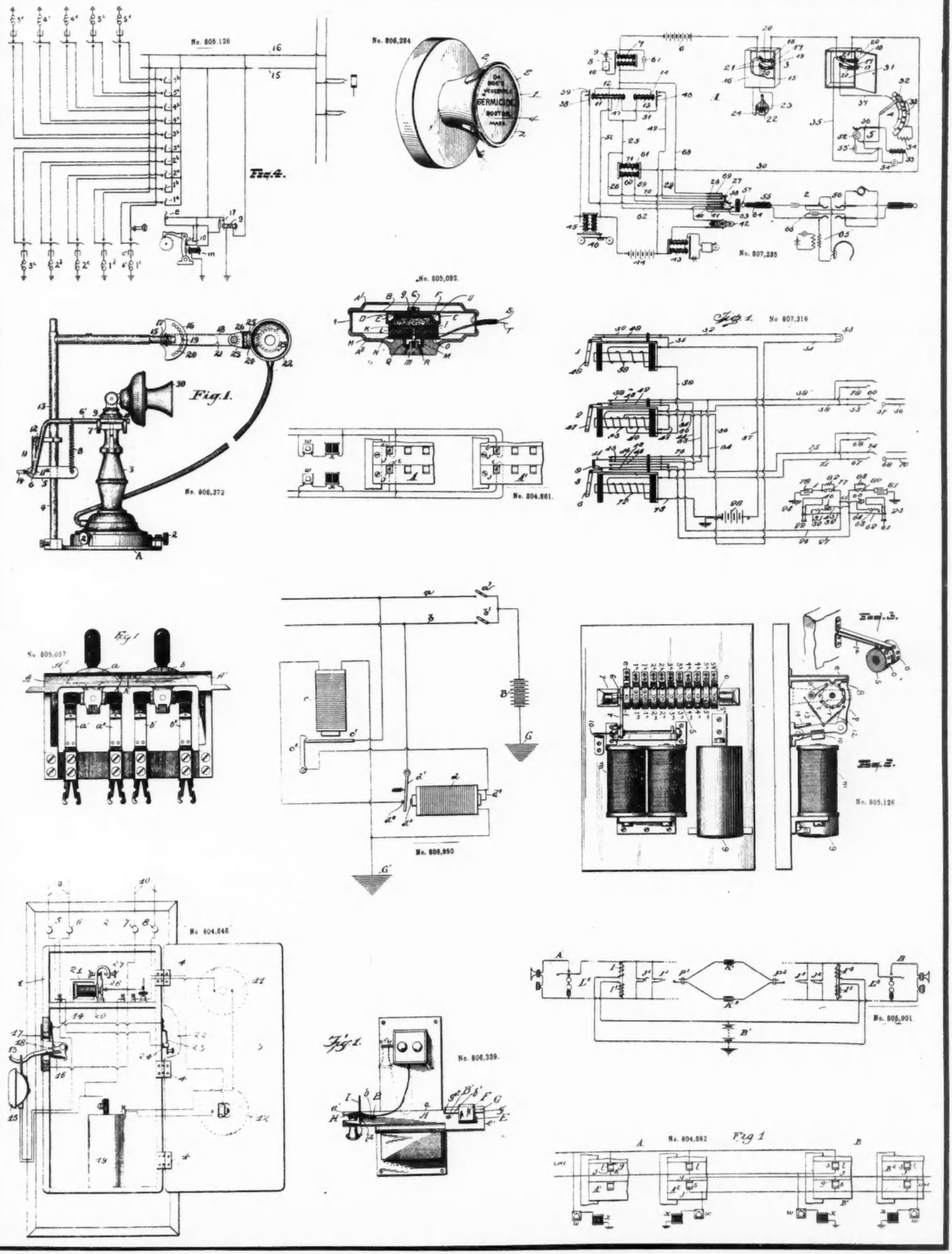
806,372. Telephone Attachment; J. Silverman. A bracket for holding the receiver, shown attached to a desk set, rotatable, so as to work a cam to throw a lever down on the switch hook when the receiver is out of use. Patent unassigned.

806,790. Telephone Bracket; H. F. Foersterling. Another bracket to hold the entire telephone. One end has a standard carrying a post, on the post a rotating sleeve with a pair of parallel bars whose outer end carries a clamp in which the standard of the desk set may be held. Patent unassigned.

806,950. Selective System for Party-Line Telephones; W. M. Bruce, Jr. A pair of magnets, each controlling the circuit of the other, and each connected to one side of line, with a battery at central and a pair of switches, one for each side of line so that where a series of impulses are sent through one magnet the other one will be in condition to act, as to restore the mechanism, if its side line be grounded.

807,235. Alarm and Telephone System; G. Babcock. Another system for sending fire and police alarms over a telephone line. Regular boxes are provided, normally cut out, and a central office recorder in the line is shunted by a condenser. Patent unassigned.

807,316. Telephonic System; R. H. Polk. A scheme with but two line wires, and a switch relay for reversing the wires for signaling currents. In other words, a pole-changing relay to ring one way or the other, so as to select one station or another. Patent unassigned.


No. 805,126
Fig. 2.
No. 806,284
No. 807,235
No. 805,092.
Fig. 1.
No. 806,372
No. 804,861.
Fig. 1. No. 807,316
Fig 1
No. 805,057
No. 806,950
Fig. 3.
Fig. 2.
No. 805,126
No. 804,848
No. 805,901
Fig. 1.
No. 806,339.
No. 804,862
Fig 1

CONCERNING TELEPHONE MAINTENANCE

By Samuel G. McMeen

IN THE preceding article, an effort was made to develop the simple principle which underlies the operation of the polarized ringer, and in that explanation the importance of the action of the permanent magnet was developed by considering it to affect the cores alone. Experiment and thought will show that every essential action of the ringer ensues if the magnet be so placed as only to affect the cores; but that the resultant efficiency is increased by allowing it also to affect the armature. In almost all arrangements of commercial design, one end of the magnet is attached to the iron back piece which joins the cores, while the other end is brought close to the middle of the armature. The result is to magnetize the two ends of the armature similarly to each other, but oppositely from the free ends of the cores. This directly assists the operation of the ringer as a whole.

The remaining general portion of the substation telephone set is the generator. Its purpose is merely to produce a current for signaling either a central office or another station. As a device merely intended to signal the central office, any generator is too expensive long to hold its own in competition with any simple centralized source of current for that purpose. As a device for signaling other stations directly from one station, however, it is probably the simplest and most reliable method so far developed.

The maintenance difficulties with magnetic generators in substation sets are of two classes: one includes the troubles which prevent the generator from sending out proper currents, and the other is the bad effect which may result in the talking circuit from some fault in the generator.

As the current developed by the generator depends upon the strength of its magnets, as well as upon the turns in the armature, upon the total resistance of the armature and its external circuit, and upon the speed of its rotation, it is important that the magnetic field be known to be of ample strength, whenever there arises a doubt at all. A reversal of position of one of the magnets of the generator will reduce the strength of the magnetic field, roughly speaking, twice as much as if the magnet were left off entirely. All manufacturers provide means for determining the polarity of magnets, however, and nothing but an inexcusable blunder should result in so faulty an assembling.

Tests for strengths of generator magnets may not be made with accuracy by determining what load in pounds can be borne by an armature across the two ends. A number of magnets of equal strength probably would be found to sustain unequal maximum weights, because of the considerable difference in the surfaces of the ends, and the consequently varying intimacy of contact between the armature and pole pieces. As the thing desired is the maximum field of force through the armature, a convenient and satisfactory method of test may be improvised as shown in Fig. 1.

In this figure, it is intended to illustrate the counterpart of an ordinary voltmeter, with the omission of the usual permanent magnet of such an instrument. The rectangular coil need be only crudely made, wound of silk or cotton covered wire, and pivoted with reasonable freedom. Spiral or helical springs of some convenient sort carry the external circuit to the two ends of the movable coil. When current from the battery flows through this coil, no deflection will occur until some magnetic field is established, when the coil will move, settling in a new position. If the magnetic field in question be established by causing a permanent magnet to pass lines of force through the region of the coil, the indication on the scale will show a value for that magnet. If another magnet be substituted, the amount of deflection will show the difference in the magnetic fields produced about the coil, and if the magnets be similarly placed with relation to the coil, the readings may be taken as a value for the relative strengths of the two magnets. The direction of deflection also will show the polarity of the magnet. In the figure, C is the coil and M the magnet under test.

It is not essential that the apparatus be constructed with such accuracy as would be required for close measurement of currents, nor that the scale be graduated in accordance with any fixed system. All that is needed to be known is comparative.

All three of the substation sets shown in the preceding article are of the series type, and each the generator was shown equipped with the device which short circuits the armature winding during all times when the generator handle is not under pressure or in motion. There is a wide variety of such devices, some depending on a motion of the crank shaft, and others on a motion of the armature shaft, but in all the same result is desired.

In either of the types shown, a failure of the shunt would have no harmful effect upon the operation of the telephone set at that station, but with a plurality of such instruments in series, as was formerly the general practice and as still is true in some quarters, a failure of the shunt device to short circuit the armature would introduce several hundred ohms

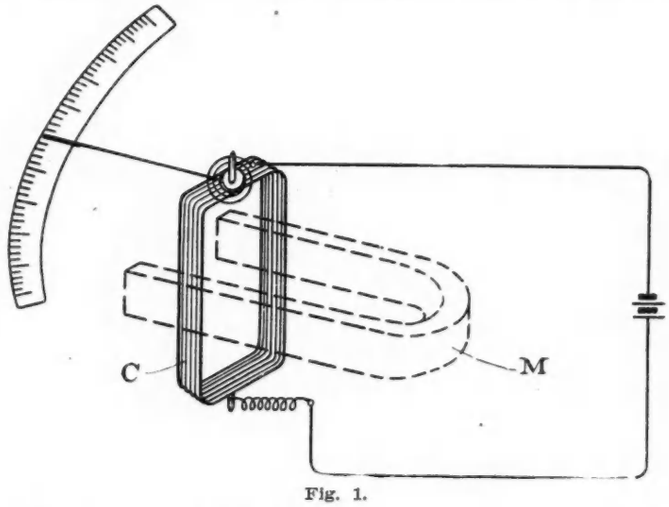


Fig. 1.

of fine wire into the line during the conversation from other stations, and also the possibly poor contact at the oiled bearing next to the spur gear.

Worse than this, it would introduce an impedance very much greater than that presented by as many ohms of mere wire. In an ordinary position of rest, the barrier to voice waves through an ordinary armature is fully as great as through the usual clearing out drop, or through a bridging ringer wound to a thousand ahms.

Figure 2 shows the circuits of a bridging magneto set, which, so far as the talking circuit is concerned, involves the same elements, with the same relations to each other, as exist in a series set. The signaling circuit, however, differs from that of a series set in that the ringer is permanently bridged across the line and is wound with many turns of fine wire, giving a high impedance.

Voice currents pass through this ringer with such difficulty that the shunt it forms around the telephone set is practically negligible. The generator also, while its handle is being turned, is bridged across the line and delivers current to it, whether or not the receiver be on the hook. Normally, however, the generator circuit is open, and in this particular its mechanism differs from that of a series bell. The difference will be clear by comparing Fig. 2 with those of the preceding article, or by examining the structures of

bridging and series sets. While in the series set, then, the contact making and breaking mechanism is intended to eliminate the generator armature winding by *short-circuiting* it, this winding is eliminated in the bridging set by *opening* its circuit.

In generators used in sets of either type, a failure of the armature to deliver current may be due to an actually open circuit within the armature, to a failure of the brush or shunt-breaker or circuit-closer to make or break contacts as required, or to a short-circuit of the armature winding itself. Too much oil in the oil cups may destroy the insulation between the parts of the winding or between the points which

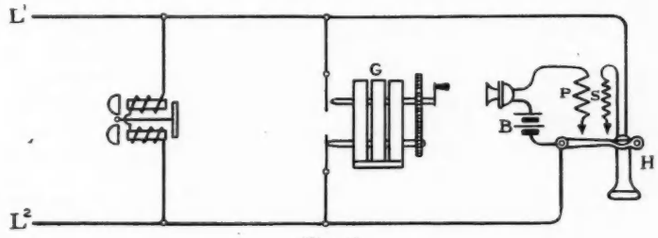


Fig. 2.

should be insulated and the iron of the armature. The amount of oil used should be as small as is consistent with smooth running.

A form of party-line equipment involving the use of bridging generators and high impedance ringers branching to ground from the two sides of the line is shown in Fig. 3. This arrangement is a traffic improvement on the usual party line with many ringer bridges. Its advantages is that the total number of stations is divided into two groups, the central office ringing the necessary code signals, with currents to ground over one wire or the other. So far as calling the stations is concerned, then, each wire is a distinct entity. Calling the central office is done over the metallic circuit, as also is true of talking.

The troubles common in the use of the various elements of such substation sets are the same as those met in ordinary bridging outfits. A difficulty sometimes presents itself in addition, in that when one of the stations calls the central office, all or a part of the station ringers will be operated. This is because there are several paths over which the current from the operated generator may pass, one being through the central office drop, and the other *to* ground *from* all the ringers branching from one wire, and again *from* ground *to* the other side of the line, through all the ringers branching from that wire. Assuming there are eight stations on the line, this would mean that the generator operates the central office drop, and, besides, passes from side to side of the line through four pairs of two ringers each, the two ringers being as clearly in series as if their point of connection with each other were not grounded.

Although such an annoying feature of operation is more clearly a matter of equipment and installation than of equipment trouble-hunting, the nature and remedy of the trouble are introduced here in order to make the general class of magneto substation troubles sufficiently inclusive.

Either of two remedies may be chosen. The first is to equip such stations with generators having only such a number of permanent magnets each as will give a current sufficient to operate the central office signal, which is directly across the line, and not strong enough to operate any of the ringers which are bridged to ground. There is sufficient margin between the two operations to enable such an arrangement to give perfectly positive central office signals without a tendency to false ringing at the stations. Most types of three-magnet generators may have the middle magnet removed and give satisfactory results in these particulars.

The second expedient is to leave the generators equipped as they are and to make the resistance of the central office drop very low. If it be sufficiently low, and the line not too long, then the farthest station will not be able to ring false signals. An objection to the use of very low resistance central office drop is that if it be also of low impedance it will tend to short-circuit the line during conversations between two stations on that line. This may be obviated by instructing the central office operator to leave one plug of the cord-circuit in the jack during such a conversation. This imposes no particular hardship on operation, as no station can call another without the assistance of the central office. But to have a large impedance with a low resistance means many turns of large wire in the drop, and therefore to fit all line conditions it may be necessary to insert impedance in series with the drop. This may be done at either of the points marked *x* in Fig. 3.

It may be wondered why it is urged that this cure requires a lowering of the drop resistance, and at the same time it is recommended to insert resistance in series with the drop. Remembering that the impedance of a winding varies directly with the frequency of the alternating current through it, and that the frequency of voice currents is very much greater than those from a ringing generator, it will be seen that the central office drop circuit naturally will absorb a very much larger part of the slow ringing current than of the rapid speaking current.

As between the two methods, the plan involving the removal of permanent magnets from the substation sets is distinctly preferable.

In summing up the cost and cure for troubles in substation sets, it is desired again to emphasize the fact that the best possible preparation for work of this character is a firm grounding in principles, by the use of which almost any complicated case of substation trouble may be understood and removed. In the absence of this knowledge of principles, much idle and useless search will ensue, with a corresponding lack of satisfaction on the part of the workmen and the work. It has been said that one who undertakes to perform evolutions with Indian clubs, unless he has a clear knowledge of what he is going to do, is likely to inflict serious injury upon his person. The reason for this danger is identical with that of any unintelligent technical effort.

One of the most widely circulated bits of telephone liter-

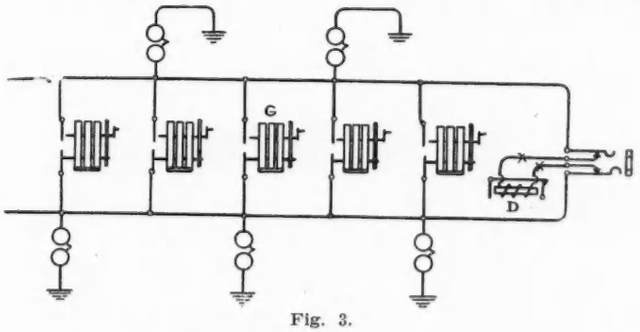


Fig. 3.

ature is a pamphlet originally produced many years ago by Messrs. W. H. Hyde and J. A. McManman, of Milwaukee, Wisconsin. It treats of the troubles in telephone sets, their cause and obvious remedies, and if judiciously used as a groundwork for thought, study and practice, should produce beneficial results. In the search for any trouble, a first step should be to know the exact circuits of the device in difficulty, and then to exclude all the places in which the trouble could not be found, attention being confined thereafter to the places in which the trouble could be found. Care must be taken to find each element either innocent or guilty, and if the latter, if guilty alone or in complicity with some other.

With these cautions in mind it may serve a useful purpose to consider specific cases.

TRANSMISSION TROUBLES IN LOCAL BATTERY SETS.

Weak Transmission.—The most frequent cause of weak transmission is insufficient current from the battery. This may not be due to the fact that the cells are exhausted. If there are two cells and their zinc poles are connected together, and their carbon poles to the transmitter circuit, or their carbon poles together and their zinc poles to the transmitter circuit, only that current will flow which results from one cell having a higher voltage than the other. If there are three cells, not all connected with unlike poles together, the result will be that two of them will wholly or largely neutralize each other, leaving only one cell effective to produce current in the transmitter circuit. If the cells are properly connected and in good condition, a poor connection may exist in any one of the several binding posts, there being six such chances in the case of three cells. It is not sufficient to know that the binding posts are firmly set. It must be remembered that all such battery connections are usually of brass and in the immediate neighborhood of corrosive salts and gases. It must also be remembered that in local battery sets unnecessary resistance in the transmitter and battery circuit are enormously more effective in reducing the transmission than they are if in the line circuit, or if in any part of a common battery circuit.

Weak transmission also results from the partial short-circuiting of either the primary or secondary winding of the induction coil, or the total short-circuiting of a part of either winding. In the absence of special evidence, the transmitter itself should be last suspected. If a transmitter has been good, and has not been tampered with, it is not usual for it to fall greatly in volume without other symptoms appearing at the same time. With present methods of transmitter manufacture, however, there is an occasional tendency of certain parts of the transmitter carbon to rise in resistance with a consequent decrease in the amount of current which may flow. In such instances, the transmission volume decreases, but in almost all cases noise accompanies the transmitter change, and this may be traced down with greater accuracy.

In all cases of weak transmission it is assumed that it has been determined in advance that the difficulty is in the substation and not in the line. In the one case the voice currents are not produced, and in the other they are not carried to destination. Personal expertness soon enables an inspector to determine whether the local production of voice currents is normal or otherwise.

Transmitter Noises.—One of the chief obstacles to successful telephone service, and, unfortunately, one not yet sufficiently regarded, is the presence of extraneous noises in the line and local circuits. Although not in the same degree, the human ear possesses a facility similar to that of the human eye, by which the latter adapts itself to the volume of illumination while still discriminating among the images which it sees. The ear is able to take account of all that is brought to it by the receiver, but in the presence of other sounds than speech, such as scratchings, hissings, or roarings, the understanding of many of the elements of speech is enormously impaired. For these reasons all causes of circuit noises in substation sets must be watched with great vigilance and removed as promptly as possible. A very great amount of telephone dissatisfaction can be traced to the occasional or continual presence of unnecessary sounds.

Such sounds originating in substation sets are usually scratching or "frying" noises. The first test is manifestly one to determine whether these sounds originate in the substation set or on the line. As previously noted, this is most simply done by opening the local circuit. A convenient point is the battery spring at the hook switch, a pressure upon this while the receiver is at the ear either stopping or not stopping the sounds. If they stop, the local circuit is guilty, and they should again stop when the spring is released and the transmitter circuit is opened at any other point, as, for example, at one of the battery connections. The most convenient means of determining the exact location of the sounds is to use a short piece of wire of good strength, with sharp ends or some other equivalent solid conductor. When this is bridged about any part of the local circuit, which should be of low and constant resistance, but really contains a variable contact, the transmitter noises will be found to cease. They will recur when the bridge is removed from about the faulty place. Often the scratching noises will continue after the short-circuiting test has been applied to every link except the transmitter itself. In such a case the noises should cease when the transmitter terminals are short-circuited. The exploration should then be continued very carefully, link by link, until it is determined whether short-circuiting the actual button terminals stops the noise. If it does, the best remedy is a change of transmitters, as it is not feasible to remedy actual button troubles on the premises. In most cases the fundamental cause will be found to be a change of the granular carbon, of one or both of the electrodes, or of some connection between the electrodes proper and the terminals which carry thm.

It is not necessary, in searching for local circuit noises, that every connection of every sort be thoroughly examined, as is sometimes recommended, but it is important to bear in mind that every connection is not completely soldered which outwardly appears so.

As there is a critical limit of maximum current which any transmitter is able safely to carry, noises appear when too much current is passed through the transmitter button. These noises are not only disagreeable in operation, but the large current causing them injures the granular carbon and the electrode surfaces.

RECEIVING TROUBLE IN LOCAL BATTERY SETS.

In a single station line, weak receiving naturally is most frequently due to an actual receiver trouble. In this difficulty, also, the entire set should be short-circuited to determine by close-listening whether the difficulty is actually local. If the receiver diaphragm is in good condition, if the pole pieces are free of foreign matter, and if the receiver cord tests to be perfect, a comparison may be necessary between the suspected receiver and one which is known to be good. If the receiver is found equal to standard, and the set receives speech partially but poorly, either of two things will be found. One is a partial short-circuit somewhere between the entrance of the line to the set and the exit of the receiver cord from it. The other is a high resistance in this same path, either in a connection or in the secondary winding of the induction coil.

A cause of weakness in series sets is a failure of the shunt at another station on a party line, resulting in leaving in the line all or a part of the harmful effect of the impedance of the armature at that station. This would result in a better transmission and receiving at the station having the defective shunt than at others, and the possible existence of such trouble without being detected is one of the minor reasons why the series system is objectionable for party line uses.

RECEIVING SIGNALS IN LOCAL BATTERY SETS.

Bearing in mind what has been developed relative to the construction and operation of the ringer, it will be evident that a chief cause of unsatisfactory ringing signals, so far as the substation set is concerned, is a weakness of the polarizing magnet. Holding a standard test magnet near or against the suspected one during a period of ringing will indicate whether or not the difficulty is in this quarter.

A short-circuited spool, or a short-circuited portion of one spool, will reduce the effective magnetism produced by the ringing current. Poor adjustment either of the armature with relation to the cores or of the gongs with relation to the hammer will result in unsatisfactory signals. The best adjustment of gongs is that in which the hammer, if moved slowly by hand from the armature end, just fails to touch either gong. There is enough elasticity in the tongue to enable the hammer to strike the gongs with a clear blow in actual operation. The adjustment of the armature with relation to the cores should need little attention, but it should be borne in mind that a danger lies in too great a separation.

SENDING SIGNALS IN LOCAL BATTERY SETS.

Assuming the magnets to be of ample strength and arranged upon the generator with similar poles adjacent, a generator failure, speaking broadly, must lie in the armature or in plain sight. Before concluding that the generator is at fault it should be disconnected from the remainder of the substation circuit and tested directly by its own ringer or to some other means of detecting its current. If then it is found that current cannot be taken from it at its proper points, the shunt or circuit closer should be examined. The shunt on the generator of a series set failing to break, the armature will be kept short-circuited during operation, and this can be detected also by the fact that the generator constantly turns hard. The contact-maker of a generator of a bridging set failing to make the contact, even though current is generating in the armature it will not be delivered to the circuit of the set, and this can be determined by the fact that the generator fails to turn hard even when its circuit terminals are connected together.

The terminal brush or brushes adapted to collect current from the current produced in the armature being found to be in proper position, if the armature delivers absolutely no current while in motion, other things being satisfactory, the winding of the armature will be found either to be open or to be wholly short-circuited. Unless open, some slight current usually can be detected by connecting the receiver to the generator terminals and turning the crank, even if a very heavy short-circuit is on the winding. A most likely place to find this short-circuit is at a terminal of the winding or at an outside turn.

A difficulty arising from an open circuit or a short-circuit in a generator armature a long way from the source of supply may be cured by re-winding the armature on the spot. While not a quick or easy process, in the absence of tools, an upturned chair may be made to serve as a reel, the unwinding and re-winding operations being performed by walking around it while carrying the armature. It is hoped that the reader may have infrequent occasion to enjoy such exercise.

MODERN TELEPHONY IN THEORY AND PRACTICE

By W. H. Ratcliffe

CHAPTER XII.

FACTORS GOVERNING THE DESIGN OF AN EXCHANGE.

THE expiration of the fundamental patents governing the construction of the Bell telephone occurred in 1895, and since that time the development of numerous telephone companies under the name of Independents has given the original Bell company much competition. In those sections of country where the older concern had furnished telephone service at exorbintant rates, or else had refused to supply it at all, many Independent telephone companies were established. The people, generally, gave these new organizations a hearty support, with the result that to-day the inhabitants of neighboring villages and small towns throughout the land are enabled to converse with each other and with the outside world, as was possible, but a few years ago, only in the larger cities. So fiercely has been waged the competition between Bell and Independent companies that the former has been enabled to hold the ground it previously controlled, only by recent improvements in its apparatus and service and by charging lower rates.

Not only has the public been greatly benefited by this turn of the wheel, but the science of telephony has been placed upon a firm basis; it has already opened a field for specializing, and the telephone engineer has become a power in the land. In no sense, however, is his lot a bed of roses; in fact, his contemporaries in the electric railway and lighting business have a soft snap in comparison. The telephone engineer is confronted not only with far more complicated circuits and more delicate apparatus. but he has also to deal with the time element, a feature upon which the efficiency of his entire installation depends. Dealing also with small currents he is constantly up against some disturbance caused by induction or capacity, and the solutions of these problems frequently necessitate a working knowledge of the electric light or railway plant causing the trouble. If his exchange be a modern one of considerable size, he must thoroughly understand the theory and operation of rotary converters, of motor-generators, and of storage batteries.

When a telephone engineer is called upon to design a telephone exchange, the first matter which presents itself for consideration is that of the location and size of the exchange. The proper location is such that the sum of all the subscribers' line lengths, measured along streets, is a minimum. This point can best be determined graphically by plotting on co-ordinate paper the relative locations of the prospective subscribers and then dividing the plot into halves, first with respect to a vertical axis and then with respect to a horizontal axis. The intersection of these two perpendicular axes will give the proper location for the exchange. This central location while being such as to give the minimum outlay for line construction, which is the largest item in the cost of the exchange, may be counterbalanced to a certain extent by the disadvantages of high rent, noise, etc. Such matters should merit due consideration before arriving at a conclusion, as the removal of an exchange when once equipped is a costly undertaking.

The building itself should be made as pretentious as the money on hand will permit, and to be properly located the best corner of the most prominent street is none too good. Ample space should be provided in each of the rooms of the exchange for future growth. A preliminary canvass of the neighborhood for prospective subscribers will furnish the necessary data to estimate from, the usual practice being to allow space for about three times this number of subscribers. The operating room in which is located the telephone switchboard should be particularly well lighted, heated and ventilated, and every reasonable convenience provided for the operators upon whom, to a large extent, depends the efficiency of the service.

The first cost of the exchange considered as a whole is

governed by a number of factors, each of which may vary to a considerable extent. These factors may conveniently be classified as the cost of the distributing boards, the cost of the switchboard with its accessories, the cost of the power plant, the cost of interior and exterior wiring, and the cost of subscribers' instruments.

Both distributing boards and switchboard should be so constructed that as business increases, additions may be made without distributing the original wiring. It is generally admitted that better telephone service can be given a city if the subscribers' lines can be led to a single exchange and handled on a multiple switchboard, than if a larger number of exchanges are necessary owing to a greater list of subscribers than could be accommodated on a single switchboard. Up to the present time it has been considered impracticable, mechanically, to construct a multiple switchboard with a capacity exceeding 9,000 lines, and it is principally for this reason that large cities each contain a number of central offices or exchanges limited in size and placed in certain well-defined centers, rather than a single large exchange centrally located. In the usual method employed in large cities trunk lines connect the various central offices, but owing to the longer time required to make connections therewith and the increased liability to error, less efficient service results than would be the case with a single exchange.

Assuming, therefore, that the size of the city be such that a single exchange meets the requirements, the first cost will be governed largely by the type of switchboard installed, and this in turn will depend upon the number of subscribers. If it be estimated that the ultimate capacity will not exceed 1,000 subscribers the transfer switchboard should be selected, while for a larger number of subscribers a multiple switchboard should be chosen in preference to one requiring a trunking system between the operators. The reason for thus distinguishing between the two types of switchboards are as follows: In a small exchange the stripping trunk lines between operators perform their functions well and do not greatly interfere with the service, while the simple construction of the transfer switchboard enables repairs or alterations to easily be made. The intricate wiring of the multiple board is therefore unnecessary in such a case, and its comparatively high cost of maintenance unwarranted. In a large exchange, however, the multiple switchboard affords far better service than could be expected from a transfer board, and the muliple type is here cheaper to operate because less operators are needed and the magneto-generators and local batteries in the subscribers' instruments may be eliminated, thus saving their first cost as well as the cost of their maintenance. Regarding the difference in first cost of the two types of switchboards, it may be stated that for the same capacity the multiple switchboard is about 150 per cent more expensive than the best type of transfer switchboard.

The first cost of the power plant if the exchange is to generate the current it uses will be that of the boilers, engines, generators, storage batteries, power switchboard and accessories, while if the current be purchased the cost of whatever transforming and storage apparatus is used, such as motor-generators, dynamotors, and storage batteries is included under this head, as well as the cost of the power switchboard and power switchboard accessories. To provide against any interruption of service it is necessary to install a duplicate set of generating or transforming apparatus, as the case may be.

The cost of interior wiring will vary according to the kind of switchboard installed, being considerably greater for the multiple type than for the transfer type of switchboard. The cost of exterior wiring will depend upon whether grounded or complete metallic circuits are used, also upon the amount of overhead and underground line construction contemplated. Regarding the former it may be stated that satisfactory and efficient service can be obtained only by employing complete metallic circuits; grounded circuits or common return lines are always more or less troubled with cross talk and other inductive disturbances. The cost of complete metallic circuits is, naturally, greater than that of grounded circuits or of common return lines, but in exchanges of two hundred subscribers or over this additional expense will never be regretted. The great difference between the cost of overhead line construction and that of underground line construction favors the use of the former in all cases except for thickly populated districts. Commencing at the exchange, however, as much of the line construction should be placed underground as the money on hand will allow, for what is spent in this way will materially lower the maintenance of the line and thus prove a good investment.

The subscribers' instruments should be chosen with great care, selecting only those best adapted to meet the requirements demanded of them. As far as is consistent, however, all the apparatus employed should be purchased of one concern although it is well to invite bids from a number of manufacturers, supplying them in each case with the necessary specifications.

Before leaving the important question of the first cost of an exchange, it may be well to give the reader some figures whereby he may form an idea of the capital required in any given installation. The figures presented are, of course, only approximate, and will vary according to fluctuations in the cost of materials; they are based, however, on prices which exist at the present time and on modern methods of construction as previously outlined. An exchange of 500 telephone instruments, located within an ordinary radius and wired throughout on open wire pole lines, will cost as a whole about $65 per instrument; an exchange of 1,000 telephone instruments employing the transfer system and overhead cables, but no underground construction, will cost approximately $85 per instrument; an exchange of 2,000 telephone instruments using the common battery system and underground cables, will cost about $100 per instrument, and for exchanges of the latter type exceeding in size 5,000 telephone instruments the cost will be approximately $160 per instrument.

The annual cost of operating an exchange may be predetermined for any given installation with a fair degree of accuracy, and includes rent, interest, and depreciation on the wire plant and subscribers' instruments, together with their annual cost of maintenance; also salaries of employes, fixed charges, and cost of current supply.

The amount classed as rent is the annual sum paid for leasing and building, which includes light, heat, elevator and janitor service. If, however, the building is bought outright by the telephone company then the interest and depreciation, including taxes and insurance on the building and grounds, are included under this head.

The wire plant includes the entire line construction from the exchange to the subsbribers' instruments, and the interest and depreciation as well as the cost of maintenance on this will, of course, depend to a great extent upon the nature of the construction; that is, whether overhead or underground lines are used.

The salaries of the employes are those paid to the operators associated with the switchboard, and include those of the day, night and relief operators, the chief operator, the monitors, the wire chief and trouble clerks, the manager and his clerks, and the matron.

The fixed charges are the salaries of the contractor, engineer, auditor, secretary, and cashier.

The cost of current supply will depend upon whether the telephone company has a generating plant of its own, or purchases the power from the local electric light or power company. In either event the cost can be easily ascertained.

THE CHICAGO ELECTRICAL EXPOSITION

By Charles R. Macloon

NO EFFORTS are being spared toward making Chicago's first electrical show, which occurs in the Coliseum from Jan. 15 to 27, as broad and complete as possible. It has been definitely decided to make the opening of the show Monday night, Jan. 15, a formal affair, admission to be by invitation only. Arrangements are being perfected by which the thousands of lights in the big building will burst into brilliancy upon receipt of a wireless telegram from President Roosevelt. Greetings will also come in an aerogram from Thomas A. Edison. The space is not as yet all sold, but there is enough contracted for by seventy-five of the wealthiest electrical concerns in the United States to assure an interesting and extensive exposition.

One of the Electrical Exposition's Prize Poster Designs. Copyrighted.

Manager Mercein is in receipt of a wireless message from Dr. De Forest, dated at the temporary test station in Madison Square Garden, New York City, stating that he will establish a temporary station in the Coliseum during the two weeks of the show and to demonstrate the practicability of his wireless telegraph service will accept commercial business from this point to Kansas City, St. Louis and New York City. Dr. De Forest will also make some tests which if successful will show startling results in speed and accuracy in the transmission of messages. He is mapping out a 4,000-mile relay route, taking in St. Louis, Memphis, Houston, New Orleans, Key West, New York City and Montreal, over which a wireless message will be flashed from the Coliseum, returning to the same point. He expects to transmit this message over this route, touching one or two of the United States battle ships on the Atlantic coast and returning it to the Coliseum within five minutes of the time it is started.

The various telephone interests throughout the country have taken an unusually keen interest in the coming show and much that is new in telephone inventions will be shown. Prominent telephone men from all parts of the United States will attend the show and three days — Jan. 22, 23 and 24—have been set aside as "telephone" days. One of the interesting exhibits to be made by the Chicago Telephone Company will be the "theatrephone" by which visitors at the exposition will have a chance to hear the music of one of the performances at the downtown theaters during the two weeks of the exposition. Arrangements have been made by which "The Prince of Pilsen," playing at the Studebaker at that time will be put on the "theatrephone." By this scheme people may hear the opera almost as well as they would were they in the theatre.

During the exposition there will be three conventions at the Coliseum — those of the Northwestern Electrical association, the Electrical Salesmen's Association and the Creditmen's Association of the Electrical Trades. Ben. Franklin day will be celebrated Wednesday, Jan. 17, the two-hundredth anniversary of this great philosopher's birth. There will be other special days during the show, one of which will be devoted to the tech-

nical classes. Several of the colleges of the middle west will send their entire technical class to the show.

Efforts are being made by the management to get Prof. E. L. Ovington to come to Chicago during the show. By the use of the "high frequency currents" as publicly tested by Prof. Ovington, it is possible to pass 200,000 volts through the human body without any evil effects resulting. The ordinary current used at Sing Sing to kill a man is 5,000 volts alternating current, although 3,000 is considered sufficient. Prof. Ovington says: "The ordinary alternating current of electricity is a vibratory form of energy which oscillates so slowly that it affects our senses. If this same current is made to vibrate faster there will be no effect upon the sensory system. This is actually what the high frequency apparatus accomplishes."

In the first of recent tests, one lamp was held against the professor's forehead, and the other against his shins; they both became brilliantly illuminated. In the next experiment Prof. Ovington allowed Dr. De Forest to transmit a wireless message through his body to an operator at the other end of the Garden.

The message was: "May the Lord have mercy on Brother Ovington during this experiment."

The complete list of exhibitors to date is as follows:

Ackerman-Boland Telephone Company, Allis-Chalmers Company, American Circular Loom Company, American Conduit Company, American De Forest Wireless Telephone Company, American Electric Company, American Electric Fuse Company, American Novelty Company, American Steel & Wire Company, American Electric Sign Company, American Telephone Journal, Automatic Electric Company, Bryan-Marsh Company, Central Electric Company, Chicago Battery Company, H. B. Camp Company, Chicago Compound Battery Company, Chicago Edison Company, Chicago Pneumatic Tool Co., Chicago Telephone Company, Frank B. Cook, Crane Company, Crocker-Wheeler Company, Wm. P. Crockett & Company, Electric Appliance Company, Electrocraft Publishing Company, Electro-Dynamic Company, W. L. Freed Company, J. Lang Electric Company, Edwards Headlight Company, Engineering World, Electric Storage Battery Company, Federal Electric Company, Fort Wayne Electric Company, North Shore Electric Company, Sam. J. Gorman & Company, Guarantee Electric Company, General Storage Battery Company, D. Holcombe & Company, Safety Armorite Conduit Company, W. H. Schott, W. Schiedel Company, Simplex Electric Company, Standley G. I. Company, G. H. Thordarson, The Engineer Publishing Company, Universal Electro Storage Battery Company, Vesta Accumulator Company, Western Electric Company, Wagner Electric Manufacturing Company, Westinghouse Electric & Manufacturing Company, Western Electrician, General Electric Company, Haller Machine Company, H. T. Paist Company, Krantz Manufacturing Company, Lincoln Electric Manufacturing Company, Monarch Electric & Wire Company, Miller Anchor Company, Mark Manufacturing Company, McFell Electric Company, Nungessor Electric Battery Company, Oliver Manufacturing Company, Overbaugh & Ayers Manufacturing Company, Osburn Flexible Conduit Company, Peabody Coal Co., Peru Electric Manufacturing Company, Porter & Berg, Peterson Manufacturing Company, Roeblings' Sons' Company, Roth Brothers, Reynolds Dull Flasher Company, J. L. Schureman & Company, Stromberg-Carlson Telephone Manufacturing Company, Swedish-American Telephone Company.

WISCONSIN TELEPHONE CONVENTION

By P. A. Landor

THE annual meeting of the Independent Telephone Association of Wisconsin was called to order at the club room of the Hotel Pfister, Wednesday, December 20, 1905, at 12:45 p. m., President Richard Valentine in the chair. The president said:

"I think the question of allowing sublicensees of the Bell Telephone Company to remain members of our association is an important one. A resolution was passed four years ago depriving them of membership, but no action was ever taken on the resolution. It practically has not been put into effect. I am strongly in favor of putting that or a similar resolution into effect at the present time. There are really only three paying sublicensee members at present on our roll of membership, and they should not expect to remain members of an Independent association."

A motion was made, seconded and unanimously carried that Mr. J. C. Harper and Mr. W. F. Goodrich be appointed as a committee to draft resolutions regarding the sublicensee question just referred to.

President: I think it would be well to have that same committee draft a resolution to be presented to the Milwaukee common council in advocacy of granting an Independent franchise here in Milwaukee, and I will appoint on that committee Professor Wilder, Messrs. Webb, Harper, Barr, Goodrich and Bates.

Upon motion made, seconded and unanimously carried, an adjournment was taken to the place of meeting of the judiciary committee of the common council at the city hall in the city of Milwaukee, in order that the representatives of this association may present and argue an appropriate resolution urging the importance of the prompt passage of a franchise to some Independent company to establish an exchange in Milwaukee, said argument to be made part of the minutes of this convention.

The association met in the presence of the council committee at three o'clock.

The question under discussion before the committee was whether a measured or a flat rate system of charge for telephone service, was preferable, and Mr. Valentine, as representing the Wisconsin Independent Telephone Association, was called upon to express his views.

Mr. Valentine: Representing the Independent telephone association, of which there are quite a large number of companies in membership, I have yet to find one of our companies that is not opposed to a measured service system; and I have talked with all of those that are represented at our convention here to-day, and there are none of them that are in favor of a measured service plan. We do not believe it could be successful in any city where the competition is strong. Of course where a company has a monopoly they can do about as they have a mind to. There is no doubt but that a measured service is a mighty good thing for the company. There is more money in it. If there was not they would not have adopted it as they have in Chicago, and I presume more or less in Milwaukee, but where we have competition I do not think any of us could compete with the Bell company for a month using measured service.

The judiciary committee of the common council held a very long session, during which the question of the relative advantages of a first rate and measured rate for telephone service was considered, and by direction of the committee arguments were confined to that subject.

Among those who presented arguments on the matter pro and con, were Mr. Bills and Mr. Farnsworth, of the firm of Bills & Farnsworth, of Chicago, Mr. Max Zabel, Mr. Stroud and Mr. Hoffman.

The chairman of the judiciary committee suggested that the committee vote on the question of the adoption of one of the two systems proposed, thus eliminating certain classes of franchises from consideration.

This was strongly opposed by Alderman Seidel, who wanted the question left open for future discussion, so that even if the committee decided on the adoption of one system or the other, nevertheless such dcision should not absolutely preclude applications for franchises under the other system from being considered.

Mr. Hoffman suggested that his company proposed a system which would have the advantages of both the measured and the flat rate system, offering flat rates to large dealers and measured rates to small dealers.

The committee apparently were ready to recommend that some Independent franchise be adopted, that is, they were favorable to an Independent franchise, but were not ready to decide between the various systems and franchises offered, and as the judiciary committee evinced willingness to recommend an Independent franchise or franchises, the association decided, on conference, not to present the resolution prepared according to the direction of the association this morning.

The judiciary committee being unable to reach an immediate agreement, and having been in session for three hours, adjourned subject to the call of the chairman, the chairman stating that the next meeting would be called in about two weeks, when the various franchises offered would be considered.

The Wisconsin Independent Telephone Association thereupon adjourned to the Hotel Pfister, next day, Thursday, December, 21, 1905, at 10 a. m.

SECOND DAY'S SESSION.

President: The first thing in order will be reports of committees.

Mr. Harper: This resolution pertaining to the membership of the association is recommended by the committee to which the matter was referred, and is as follows:

Whereas, this association is organized on the principle of other state associations, and is affiliated with the National Interstate Independent Telephone Association;

And whereas, on January 25, 1901, this association passed a resolution now construed to refer to all Bell sublicensee companies in this state; therefore,

Be it resolved, that the secretary be and he is hereby instructed to accept no more dues from Bell sublicensee companies, and that their names be stricken from the membership roll of this association at once.

Signed by the entire committee.

Motion was made, seconded and unanimously carried adopting the report.

President: Is there anything else, Mr. Harper?

Mr. Harper: Mr. Webb is not here this morning, and I would say in reference to the resolution that is to be prepared, to present to the Milwaukee common council, regarding a franchise in this city, that it seemed best after talking the matter over yesterday, to prepare a resolution at some length, setting forth Independent conditions in the state, and one which would appeal to the Milwaukee common council, and have that put into the hands of some member of the council, who is friendly to the granting of a franchise, and presented by him to the council at their final meeting, upon the granting of a franchise.

It seemed hardly necessary to proceed to prepare that resolution in full yesterday, and my thought in reference to it is this, that the committee prepare a resolution to which they can give some little time, and have it presented later on to the council.

In our visit to the committee on judiciary of the common council yesterday, there did not seem to be any opening or it did not appear that anything could be accomplished particularly, by insisting upon the things that we discussed, that is, passing a resolution urging the council to hurry up with their work. Consequently it seems to me that the committee that was appointed on that question should prepare a resolution at length in connection with the entire matter, and have that presented to the council by one of the aldermen.

Mr. Harper: I presume the association, by unanimously appointing that committee to prepare a resolution, conveys to the council the unanimous opinion of the association regarding the situation.

President: I do not think there are two sides to that question, as to whether we want an exchange in Milwaukee or not.

Mr. Harper: Consequently, after the resolution is prepared and submitted to the various members of the committee and signed by them, it can be indited in such a way as to show it to be the consensus of the opinion of the association.

A motion was then made, seconded and unanimously carried that the committee draft a resolution urging the common council of the city of Milwaukee to grant an Independent telephone franchise in this city as speedily as possible, said resolution to be worded in accordance with the wishes of the association as expressed in convention.

Mr. Bell: I move that a committee of three be appointed to nominate officers for the ensuing year.

Motion seconded and unanimously carried.

The president appointed the committee as follows:

Mr. W. J. Bell of Deerfield, Dr. G. N. Hidershide of Arcadia and Mr. Charles Shernecker of Sun Prairie.

Mr. S. A. Dinsmore: Mr. President, I desire to show you a copy, Vol. 1, No. 1, of the Illinois Telephone Exchange News, dated December, 1905, published at Gibson City, Ill. This paper is interesting as being avowedly Independent, but really published in the interests of the Central Union Telephone Company.

President: That this is true is really indicated by the advertisements.

The Western Electric Company occupies half of the third page of this copy, and we know where their interests lie.

The by-laws which have been adopted by the Illinois Sublicense Telephone Association, say that the object of this association shall be for the mutual protection and development of the interests of all sublicensees of the Central Union Telephone Company in the state of Illinois, and that any sublicensee of the Central Union Telephone Company in the state of Illinois is eligible to membership in this association, and that every member in person, by proxy, or by general power of attorney, shall be entitled to one vote only at any regular or special meeting of this association.

Mr. Harper: The Central Union telephone men are undoubtedly back of the whole matter.

The Wisconsin company has been paying the expenses of sublicensee companies to meet in different parts of the state. I know fifteen or twenty were present at a meeting in Janesville. They met in Fond du Lac and Oshkosh on the same terms. They are meeting all around in different parts of the state. They call in all the sublicensee companies and the Wisconsin Telephone Company pays all expenses, even to railroad fare.

I am sorry there are not more here, because I wanted to talk to you in regard to our telephone bill that we succeeded in passing last winter, after a fight during two sessions of the legislature. The Wisconsin company is paying no attention whatever to that bill. They claim that it is unconstitutional, and of course I suppose they think nothing will be done about enforcing it, but something ought to be done, and a movement has been started already, and some funds have been collected for that purpose. The other com-

panies, La Crosse, Janesville and Madison, have subscribed $100 each, and we would like to have all the companies in the association take part. It will cost some money to enforce that law. The attorney-general will bring the suit all right, but we ought to have a first-class attorney to assist him, because we cannot expect him to do all the work, and these things cost some money. The best lawyers in the state, some of them, tell me that there is no doubt about the constitutionality of the law. I have talked with a number of them in my town, and with the attorney-general, and I think Mr. Harper talked with the governor about it, did you not, Mr. Harper?

Mr. Harper: Oh, yes.

President: And all of them think that there is no doubt about this being a constitutional law, and once a suit is brought and you get a decision, it must help the Independents of the state very much, because you know how the Bell company is discriminating. In some towns they give away telephones. In La Crosse they charge $2 to $3 for single lines, in Oshkosh $3 and $4, and in some cases $5 for the same service, and so generally there is a great difference in the charges made in towns of the same class.

Mr. Harper: Racine, Oshkosh and La Crosse are in the same class.

President: I venture to say that in Racine there are plenty of telephones for which they charge nothing, because they are making a hard fight against the Independent company there, while in Oshkosh, where there is no fight against the Bell monopoly, the same old rates are charged. Under the law the same rates must be charged in towns of the same class, and that law if obeyed would do away with a lot of the spirit of unfair competition that we have to meet, and have had to meet ever since the Independent companies have attempted to do business in the state of Wisconsin.

President: Mr. J. Shirley Eaton of New York, who represents the new invention, the Poulsen automatic telegraphone, is present here, and has very kindly consented, if you wish him to do so, to say a few words about the telegraphone and its relation to telephone service.

Mr. Eaton: This is a courtesy that I had not expected. I was here entirely by chance at the time you were having your meeting yesterday, and I am not a telephone man, and if I were to start out to tell you what I don't know about telephones your session would last a long time. However, I have here an instrument, that in one of its features of application bears upon the field of the telephone very directly. The name given this instrument, the telegraphone, is somewhat unfortunate, in that it has been used before, as I understand it, to describe what is sometimes called grasshopper telegraphy, that is, telegraphing from a parallel wire to a moving train. And again I think that the vernacular of the railroad operator has coined the same word, telegraphone, in which he has made the hybrid from telegraph and telephone, where he does composite work over the same line. But this is an entirely different thing, and I am safe in saying that nearly all of you have heard of it, because, as a scientific invention it has aroused a great deal of interest. It is a discovery rather than an invention, as I am told (and I must be careful to state these things on the authority of others, not being originally a scientific man myself). I say this telegraphone is the result of a discovery in magnetism which was revolutionary. I think it is generally understood that magnetism flows in any metal on which it may be lodged, somewhat as water does on a blotter. That is the analogy that is commonly given. Mr. Poulson, the engineer and superintendent of telephones in Denmark, discovered that he could absolutely localize magnetism in virgin steel under proper conditions. This he did, and on that single principle this machine was evolved. The principle was announced at the Paris fair in 1900, but the adaptation of that principle to commercial uses has been, of course, like all those things, slow; but now some five years have elapsed, and there are now three commercial machines, with somewhat different purposes, made. One is that which permanently records telephonic communication, and that is the instrument in which you may be interested. For instance, speaking of its commercial applicability, I have been told by those in the telephone field in the very early stages, that the public looked somewhat askance upon the telephone, regarding it as a mere toy, for two reasons; one was, strangely enough, that people would not talk to a man they could not see; and the other one was, which we can understand in part to-day, that they could not record the conversation, and therefore, could not use the telephone in business. I ran across a man in Syracuse the other day, who had been very pronounced about that. He told me at one time of having an option on one-fifth of the early original telephone stock, and trying to join hands with another man in Syracuse, to take it up; and his friend said to him: "There are only twenty-two telephones in Syracuse, all of them in saloons, and they are only useful to sell beer. I guess that we won't find a very long life in that sort of enterprise. I will keep my money in my pocket. When I want to talk to a man, I write my note, and I send for a messenger. I hand the note to that messenger, and I know that the man receives it. Do you think that I will talk to a box in the middle of the table (that was the then arrangement of the telephone) to a man whom I do not see, and receive and send a message which is not recorded? No, I am not a lover transmitting a billet doux to my fiancée."

So this telegraphone now completes the service in one particular in which it was deficient. It makes a permanent record of any telephone conversation on a steel wire, and it will repeat that record as many times as required. I believe the test has run up to 38,000 times, and that is enough. The record can be wiped off at will, by demagnetizing the wire. The machine is so arranged that by merely setting a switch a second record can be put on the wire to take the place of the first. That is, a direct dictation record, or a telephone record over the same section of wire, has the effect of closing circuits which wipe out the existing record and leave a little demagnetized space of an inch before the next record is put on. So that, from the standpoint of the operator, the second record wipes out the first, if it is desirable to do so, and you have no consciousness of wiping it out, but that is done automatically.

The general principle of it is this, that we have a local telephone circuit transmitting electrical impulses, which are transmitted to an electro-magnet into a magnetic flux, setting up relations by magnetism, corresponding with the original relations induced by speech, and the problem solved by the inventor was storing that flux, or localizing the magnetism, as I have stated, upon the virgin steel wire, as it passes the electric poles. Those lines of force can be taken up on a wire, disc or cylinder, and the lines of force remain permanently fixed in the wire, disc or cylinder, unless removed by demagnetism. Then we go back to the beginning of the dictation on the wire, and the operation is reversed, a current is generated the same as was originally generated by the voice through the transmitter; so that expressing it in other terms, we have telephoned and detained our message on steel, and can retain it there until we see fit to repeat it or remove it by demagnetization.

The steel wire machine which I have mentioned is an instrument consisting of two spools of wire winding from one to the other spool, this wire being 1-100 of an inch in diameter and moving between the poles of a small electromagnet at the rate of ten feet per second, and when connected with a telephone the wire has recorded upon it, by localized magnetism, the sound waves, as heretofore stated. To repeat the conversation the wire is wound back to the place of beginning of the record and then wound on the other spool again, when the reverse operation takes place, and the record is distinctly heard.

The uses of the instrument are of course as yet, experimental, although the field for it will be very large. We are able to record telephonic speech. That is important in recording contracts, conferences over the telephone of things of serious import, orders that you want to keep memoranda of; and these memoranda can be transcribed on the typewriter, if it is required, as the machine will repeat slowly so that the typewriter can take off the record.

I remember an instance pretty well that occurred when I was connected with the successors of Vermilye & Company, bankers, of New York, where an order was placed for 1,000 shares of a certain stock, the orders coming over the telephone, and a dispute arose as to whether it was sell or buy. No such error could occur if a permanent record were taken of the telephone conversation. This invention completes and rounds out the telephone service. It widens the field and confirms the superiority of the telephone and opens up vast possibilities in the telephone service. For instance, it is possible to open up typewriter bureaus. I do not suggest that as an immediate desirable requirement; but in the case of people who cannot afford to employ stenographers all day long, and wish to dictate over or at irregular hours, by calling up the telegraphone at a central exchange, papers, letters and documents of various kinds can be dictated and transcribed at a typewriter bureau. A man can be called up in his absence and a record made of the telephonic communication on the telegraphone. It will automatically register physicians' calls in their absence. In fact hundreds of advantageous uses of the machine can easily be imagined.

There are in this country only fifteen telegraphones. They are all made in Denmark. The manufacture of them has begun in this country, and in a few months we will have the American product ready for delivery. The type of machine will be changed somewhat, but the essential part of it will remain the same. When a Yankee builds a machine he starts at the axis and works out. When a foreigner does it he starts at the outside and works in. Foreign machines have more gingerbread work on them than American machines. The Yankee gets to the heart of things and omits non-essential details. Therefore, in the American manufacture we could probably dispense with some matters now found on the foreign machine, but the same results will be produced. I should be pleased to attempt to answer any questions you may put to me, and also to show you the machine if you desire to see it.

The secretary's report was then presented as follows:

This association was organized at Weyauwega, March 21, 1900, with eighteen members, since which time the membership has grown to sixteen active and twenty-nine associate members, comprising approximately three-quarters of the Independent telephone organizations in this state. The increase in the number of companies, and the growth of the Independent telephone interests continues steadily.

Forty-one new companies were incorporated in 1902, forty-nine in 1903, thirty-two in 1904, and during this year thirty-nine new companies were organized with a capital of $415,000.

A careful estimate based on the best data obtainable gives us 300 Independent telephone companies with an investment of four million dollars; 1,300 toll stations, 375 exchanges and 42,000 subscribers.

Mr. Goodrich of La Crosse moved that the assessment for the coming year be placed at two cents per telephone and two cents per mile of toll line.

The motion unanimously carried.

President: Is the committee on nominations of officers ready to report?

Mr. Bell presented the report, which was read by the secretary as follows:

For president, Richard Valentine of Janesville.

For vice-president, J. C. Knoni of Sauk City.

For secretary and treasurer, W. F. Goodrich of La Crosse.

Executive Committee: William Van Middlesworth, Racine; Philip Sheridan, Green Bay; J. C. Harper, Madison; E. I. Bates, Chippewa Falls; John M. Baer, Appleton; W. J. Bell, Deerfield; J. C. Crowley, West Superior.

Motion made, seconded and unanimously carried, that the report of the committee be adopted, and that the nominees therein named be declared duly elected officers and executive committee respectively of this association for the ensuing year, that the rules be suspended and that the secretary be instructed to cast the ballot of the association for them, which was done.

President: I want to thank you for your continued confidence in me. I would have made no objection whatever if you had elected somebody else to the office of president, and I do not know but that you ought to have done so. I do not know as it is fair for me to occupy this exalted position right along year after year. But as you saw fit to retain me in the office I will endeavor to do my best to fill it. I have tried to thus far, and I think I have done a little work in the interest of the association, and the Independent telephone enterprise, and I expect to keep right on. I do not think any member of the association has any doubt as to whether I am Independent or not.

The time of meeting was changed last year to December, but I think the former date was better chosen. The old date was the second Wednesday in February, and I think it would be a good idea to leave the matter of when and where we shall hold the convention to the executive committee.

Mr. Goodrich: I move that the time and place for holding the next annual convention be left in the hands of the executive committee.

Motion seconded and unanimously carried.

Mr. Dinsmore: I would like to call your attention to the electrical trades exposition that will be held in Chicago, January 15th to January 27th. This is the biggest thing of the kind that has ever been held. In fact, there has been over twice the amount of space applied for that we have had in the Coliseum, and I think it would be well worth while for anybody interested in the line of telephony, or in the electrical field, to attend that show, as I am positive that it will be instructive, and that whoever attends will be greatly interested, and I therefore invite you to attend the electrical show, on behalf of the Electrical Trades Exposition Company.

I might also state that there is a Wisconsin man who is the general manager of the exposition company, Mr. Thomas R. Mercein, of Milwaukee, with whom you are all probably acquainted, as he has been the secretary of the Northwestern Electrical Association for several years past.

After action on Mr. Dinsmore's invitation the convention adjourned.

The following companies had representatives in attendance at the convention:

Dane County Telephone Company, Madison, J. C. Harper; Deerfield Telephone Company, Deerfield, W. J. Bell; United Telephone & Telegraph Company, Chicago, C. W. Forbes; Badger Telephone & Telegraph Company, Milwaukee, E. Sipperly; Rock County Telephone Company, Janesville, R. Valentine; La Crosse Telephone Company, La Crosse, W. F. Goodrich; Monroe County Telephone Company, Sparta, H. Teasdale; Edgerton Telephone Company, Edgerton, F. W. McKinney, Andrew MacIntosh; Beloit Telephone Company, Beloit, Alfred Slater; Evansville Telephone Company, Evansville, R. M. Richmond; Rock County Farmers' Telephone Company, Janesville, H. C. Willitz; Cambridge Telephone Company, Cambridge, G. W. Wilder; Chippewa County Telephone Company, Chippewa Falls, E. I. Bates; Milton and Milton Junction Telephone Company, B. H. Wells and A. D. Burdick; Western Wisconsin Telephone Company, Arcadia, Dr. G. N. Hidershide; Jefferson County Telephone Company, Fort Atkin-

son, A. M. Webb; Fox River Valley Telephone Company, Appleton, J. M. Baer; West Shore Telephone & Telegraph Company, Don Farnsworth, W. Bills and J. W. Wegner; Cedar Lake Telephone Company, Schleisingerville, John Rosenheimer, Jr.; People's Postal Telegraph Company, Milwaukee, H. D. Stroud; Grafton Telephone Company, Grafton, Fred Mintzlaff; Plymouth Telephone Company, Plymouth, C. N. Fisher; Mazomanie Telephone Company, Mazomanie, D. L. Bester; Eastern Wisconsin Telephone Company, Kiel, H. B. Grave, W. F. Pinnow and A. A. Paulson; Badger Telephone Company, Oconomowoc, H. E. Rosenow; Mineral Point Telephone Company, Mineral Point, R. J. Penhallegan; Ashland Home Telephone Company, Ashland, W. P. Hyland and Fred M. Cole; Waupaca Telephone Company, Waupaca, A. G. Slater, C. R. Clausen; Interurban Telephone Company, Sun Prairie, Charles Schernecker; Troy & Honey Creek Telephone Company, Sauk City, J. V. Schmidt; Monroe Telephone Company, J. J. Weirich; Central Wisconsin Telephone Company, Portage, Mrs. C. A. Colonius.

LIST OF EXHIBITORS.

Julius Andrae & Sons Company, Milwaukee, J. C Schmidtbauer and H. P. Andrae; Frank B. Cook Company, Chicago, F. W. Pardee, P. M. Chamberlin, R. E. MacDuff; Kellogg Switchboard & Supply Company, Chicago, Frank Rotchka; Vought-Berger Company, La Crosse, P. W. Goodman; American Electric Telephone Company, Chicago, M. W. Zabel, J. C. Henderson; Illinois Electric Company, Chicago, E. A. Quarfot, N. G. Harvey; Standard Telephone & Electric Company, Milwaukee, H. M. Eldred, H. C. Biester; Stromberg Telephone Manufacturing Company, Chicago, J. Nate; Milwaukee Telephone Manufacturing Company, Milwaukee, F. J. Whittemore, A. Geiger; Independent Telephone Manufacturing Company, Madison, A. L. Burch, Frank Quinn; Armour Institute, Chicago, Dr. G. W. Wilder; Sterling Electric Company, Lafayette, Ind., H. T. Doolittle; Monarch Telephone Manufacturing Company, Chicago, L. Q. Trumbull and A. Duncombe; Electrical Appliance Company, Chicago, S. A. Dinsmore, J. B. McMullen; Miller Anchor Company, G. H. Miller; North Electric Company, Cleveland, Ohio, I. J. Kusel; J. A. Roebling Sons Company, Chicago, A. Wissler; Automatic Electric Company, Chicago, C. L. Fisher; Standard Underground Cable Company, Chicago, Mr. O'Neill.

INDEPENDENT TELEPHONE CLEARING HOUSE FOR IOWA

Paper read before the Southwestern Iowa Telephone Association

By George T. Hewes

WHILE local conditions are factors to be considered in the successful prosecution of any particular line of business, I shall confine my remarks to the general toll question or rather a toll line system which covers the state of Iowa, which may or may not, apply to similar systems in other states, but generally may be applied to all western states where the local exchanges are in a large measure dependent upon the farming communities which surround them. The telephonic communication between villages, towns and cities has reached a point in the development of the business when it is not only local, but far reaching, and inter-communication between different states over the lines of various different Independent telephone companies, makes it imperative that a universal understanding should be had of the basic principles involved in the promulgating, building, and operation of toll lines. I am to deal more particularly upon the subject of the operation of toll line companies, as the operation may apply to the ultimate establishment of a checking or clearing house. Where the "proceeds from toll charges may be divided" equitably. Without particular reference to the advantage of preventing the expenditure of vast sums of money in paralleling Independent toll lines already established. Not only shall we consider the toll line as a great earning power but particularly as a safeguard to our exchange interests. The toll line system of a company is governed by laws as immutable as the laws of nature and in principle may be compared with springs, brooks and rivers, where an unrestricted flow must be maintained or congestion will be followed by disaster. A congested point in a toll line system may be compared to the stoppage of the flow of water in a water works system resulting in unsatisfactory service. The toll line plant of any company in its general character is quite similar and is controlled by conditions governing the exchange itself.

George T. Hewes.

LOCAL SYSTEM.

1. Sub-exchanges.
2. Central or general office.
3. Exchange.
4. Trunking system connecting the other three.

TOLL LINE SYSTEM.

1. Local exchange system.
2. Toll Center for entire exchange.
3. Toll territory.
4. Lines connecting toll centers.

Most of the telephone companies in Iowa have a more or less well developed toll line plant upon which conclusions looking to future extensions may be based. It is only during recent years that this has been the case. The extent to which the public will avail itself of a proposed extension of a toll line system is no longer wholly problematical.

The result of the development of toll lines in this territory by the several companies, if systematically observed, according to some universal method, will enable us to arrive at the amount of receipts per unit of population. We will find that an increase of business results principally from the following causes:

1. Improved service changing from grounded lines to metallic circuits.
2. The building of toll lines to new places.
3. The increase in the number of subscribers at the various exchanges, or the establishment of new exchanges.
4. Improved operative methods, the latter shall be the object of this article.

An analysis of the toll records of several companies (Bell) and the determination of the earnings per unit of population has enabled me to determine the extent to which

expenditures for the building up of the toll line system can be safely made. The general average of earnings per caput in all of the companies has increased in the last ten years from twenty to fifty cents. In 1903 the lowest average per caput in any company was twenty-four cents, and the highest about one dollar. Except in territories showing the very lowest average we should not hesitate to make fifty cents per caput the basis for extensions to new points, and for the territory of all companies which show average earnings above the general average we should apply the general average of their particular territory. Experience has shown them that in order to meet the depreciation and maintenance charges in toll lines the receipts should amount to at least twenty per cent of the toll line cost. They do not hesitate to recommend the construction of extensions to a toll line system whenever the prospective earnings will amount to twenty per cent of the estimated cost of the extension.

You will pardon my reference to Bell methods, but in the absence of data at our command we Iowa Independents must recognize facts pertaining to the business from whatever source they may come, and pave the way for the tabulation of the necessary data which will enable us to act intelligently.

As an example consider two towns each with a population of 1,000, and located twenty miles distant from each other. The cost of the line to connect these towns will be, say, $4,000. The anticipated earning per caput is forty cents, this gives a gross earning of $800 or twenty per cent of the cost of the line. If these towns were forty miles apart instead of twenty miles and the cost $8,000 instead of $4,000, the gross earning would be only ten per cent of the cost. Such a line might clearly be a bad investment unless the toll line company could rent pin space to farmer's companies at a price which would not only encourage the farmer but furnish additional telephone subscribers who would increase toll earnings.

From the toll company's standpoint I maintain that an exchange company can better afford to furnish switching facilities for farmers at 50 cents per month, $6.00 per year, to farmer's lines not exceeding ten on each metallic circuit, owned and maintained by farmers, rather than to undertake to furnish telephone service at $18.00 per year furnishing all equipment, building and maintaining the lines. We will average two subscribers per mile. A toll line twenty miles long will produce forty or more farmers who can be persuaded to build their own lines and pay the exchange $6.00 per year or $60.00 per circuit and the toll line company ten cents per contact per pole per year. This will contribute $160.00 towards paying depreciation and maintenance, based upon forty poles per mile. The Bell company loses out on this proposition on account of the antipathy the Iowa farmer has for them, the Iowa farmer being a factor which the Bell company has ignored.

The toll earnings per unit of population should be made the factor in determining the advisability of the construction or extension of toll lines as well as the basis for all computation regarding the toll earning capacity in any locality instead of the amount of earning per subscriber.

As an example, there is a town where the exchange subscriber's development is nine per cent, the toll earnings $5.00 per subscriber and the earnings per unit of population seventy cents. In the second place, where the number of subscribers is but five, the toll earnings $88 per subscriber, while the earnings per caput is only forty-two cents.

In order that the executive officers of a company may keep in close touch with the toll line earnings of an exchange within its territory it is essential that a statement of the following should be prepared at regular intervals:

1. Total population of the territory.
2. A list of all places in the territory that are connected to the toll line system.
3. Population of each town connected.
4. Number of subscribers in each exchange.
5. The number of public stations in each place.
6. The amount of out tolls.
7. The gross tolls per caput for each place.
8. A list of all places of thirty or more not yet connected to the system.

The organization of a toll checking system is now contemplated and the foregoing remarks will in a measure impress you as being fundamental and of great importance. No hard and fast rule can be laid down to cover all conditions, as I have said, at the outset, that local conditions govern local requirements. Therefore in a state like ours with its length of 346 miles and breadth of 210 miles we should consider possibly several center checking stations which we shall not attempt to locate until such a time as we have secured the necessary data, which we will secure along the outline previously mentioned. We must necessarily, however, locate one checking or clearing house at a point where the greatest number of telephones per mile of circuit is available and your toll tariff committee of the Iowa State association has wisely selected Des Moines.

It may interest you to know that out of a total of 25,000 telephone messages (estimate of C. E. Tarte, general manager of the Citizens' Telephone Company, Grand Rapids, Michigan), eighty-two per cent were ten, fifteen and twenty cent charges, nine per cent were 25 cent charges, nine per cent were thirty cent charges.

Throughout a radius of thirty-five to forty miles, seventy-two per cent were transmitted between the hours of 8 a. m. and 5 p. m. These facts demonstrate that local conditions are factors to be considered and suggested also that your investment is practically idle, fifteen hours out of the twenty-four.

The fixed charges against your plant are constant throughout the twenty-four hours. Means should be devised whereby the lines can be used more generally throughout the other fifteen hours. The income will then be "all velvet."

Trend of Traffic. The first step in a toll traffic study is to determine the trend of the traffic from the toll stations to the adjoining exchanges.

Exchange Districts. The trend of traffic having been determined it is possible to define the exchange districts.

Circuit Arrangements. In order to determine the necessary circuit arrangements between the various toll centers as arranged with their exchange districts, it is necessary to analyse the traffic within the toll system.

It shall be the object of the clearing house to compile all the necessary data concerning the entire toll territory. Following in general the methods of the National Inter-State Telephone Association in compiling maps, showing in detail the toll lines as they exist and each extension as it is constructed from time to time, a clearing house in each state will greatly facilitate the works of the National association. To arrange traffic, to compile tariff books for each district, to route traffic so that an equal division of tolls may be enjoyed between two points should there be two competing Independent toll lines, opening up an undeveloped territory, to make non-paying lines pay, and last but not least, to check all messages and pro rate the earnings.

NEW MERIDIAN HOME TELEPHONE COMPANY.

The friends of the new telephone system recently inaugurated by the Meridian Home Telephone Company, Meridian, Miss., are very much gratified at the cordial and enthusiastic approval and support accorded that institution since it opened for business.

The new company is a public-spirited institution, and has never yet made any claim calculated to mislead the public, and as a result has established itself very firmly in the public's confidence.

QUESTIONS AND ANSWERS

By J. C. Kelsey

BEFORE starting on the new year, or my thirty-seventh consecutive issue, under caption of Questions and Answers, I want to make a few remarks, dwelling principally upon the motives behind my persistence in maintaining these columns.

Publicity is the earmark of a successful and healthy condition. It improves morals and makes our lives more secure and happy. It makes it unhealthy for the thief, either at the foot of a Chicago street, or at the head of a life insurance company. It makes it impossible for a person to be imprisoned unjustly, or to be spirited away, for he would soon be missed, and publicity would soon turn a searchlight upon his prison.

A few years ago there was released a prison-racked stranger, who tottered into the world, confused and uncertain. This long-confined person was Telephone Engineering, and publicity is helping to place him in his rightful position. He is like a child, who, when struck deaf by scarlet fever, forgets how to talk.

But Telephone Engineering has liberty of speech, will grow, and will learn better how to talk each succeeding year. There are a few old Bell traditions still straining toward holding him silent, but their work is hopeless. God never intended monopoly in any force of nature. Once monopolize a force, and you will soon behold misshapen offspring. Consider the Bell Telephone Company, and behold what twenty-five years of silence and monopolistic treatment worked. A misshapen offspring, yes! What is a dulled business sense but a misshapen offspring. Why were they not wise enough to see that manacled speech and ill treatment of the public would surely result in disaster? It was a crime, and crime is stupid every critical time. Life insurance management was criminally conducted, but crime is not intelligent, and it revealed itself. Monopoly is a crime, therefore stupid and unable to manage itself. Hence, the Independent cause, being intelligent, will thrive long after croaking prophets are dead.

I have sympathized with that long-confined prisoner. I have heard him scoffed at, in bodies of men calling themselves electrical engineers. Right in New York, the seat of all electrical knowledge. Right in that body called the American Institute of Electrical Engineers is his liberty of speech curtailed, because of the influence of the New York Telephone Company, the most powerful offspring of the Bell.

It therefore is the province of the Independent trade paper to trade in telephone publicity, and to encourage freedom of speech, and invite discussion. With this in my mind, I have worked and urged an interchange of thought which will work nothing but good to the Independent telephone cause.

Aesop once wrote a fable of a man of middle age who fell in love with two women. One was elderly and one was young. The elderly woman insisted on pulling out his black hair to make him look old, and the young woman in her turn pulled out his gray hair, to make him look young. After a time, he became absolutely bald, and neither would have him. Aesop wisely concludes that "in trying to please everybody, you please nobody."

So in these 36 issues I have made some people mad, and others glad. I am not trying to please anyone, nor trying to anger anyone, and am trying to escape the penalty mentioned in the fable. Free discussion is invited. Criticism, particularly adverse criticism, is sought for the general improvement of these columns. Let everyone feel that he can be heard, and do not be afraid to criticise this department if it does not suit you. I am not sensitive, and am willing to learn.

We are very much interested in your magazine, both as readers and advertisers, and your "Queries and Answers department" at times appeals strongly to us. We advertise a line of goods that we fully guarantee, and give the prospective purchaser ample opportunity to demonstrate to his satisfaction the merits of the same. As we pay you our good money in advertising in your paper, trying to show the people that we have something which will give satisfactory results, do you think it good business policy to insert such answers as given to questions asked by T. T. C. and B. F. R. in your December issue? We make a duplexer which we positively guarantee, and the privilege is given to return at our expense if not satisfactory in every particular. This involves upon us all expense should we be unable to give proper results.

Your Mr. Kelsey admits that a line may be duplexed if the same is properly balanced, which condition he says, seldom exists. We own the exclusive patent on a balancing device which will create this condition, and should your Mr. Kelsey desire any demonstration in this line, we will be too pleased to satisfy him. Should we be unable to do this, we will consider ourselves amply repaid in having been shown wherein we are not able to do so, before we involve ourselves too largely financially in the manufacture of these duplexers.

Furthermore, as these subscribers of yours ask for the address of firms making this line of instruments, would it not add value to your advertising column to submit to these manufacturers the names of such parties asking this information that they may be able to demonstrate whether or not they are able to make good?

Probably, we are on a wrong tangent in taking this matter up as we have, as your Mr. Kelsey may be able to show that we cannot do as we advertise, but we are from Missouri.—E. C. H.

I have to say that I am pleased to have Questions and Answers appeal strongly to the writer of this exception.

The point involved is this: I can only tell my readers just what I have seen. The apparatus I recommend was shown to me at a convention. I have attended every convention for years, and visited every exhibit. Somehow no one took pains to show me the device in question. I am not from Missouri, and have tried hard to keep up with these eventful times.

The Query department is supposed to be educational in its scope. Whether it has failed I know not.

The following from the *Sterling Gazette* is appended for the information of our readers. We want to give every one a "square deal" and will appreciate criticism of this department:

Robert L. Fairbrother, the wire chief of the Interstate Telephone Company, made a test of the Sandwich ohmmeter which he recently purchased, on a wire that broke somewhere between Sterling city and Aurora. It was noticed by the operator that the wire had ceased to work and that it had been broken somewhere between Sterling and Aurora, a distance of 95 miles.

The ohmmeter was attached to the end of the wire in the office and the test was made for the break. The instrument located the break in the wire thirty-three miles east of Sterling. A man was sent out to splice the wire from Dixon and he located the place. After all measurements had been taken it was found that the ohmmeter had located the break within 250 feet. This is considered to be a remarkable feat in locating a break thirty-three miles from the home office and locating the place within 250 feet.

The ohmmeter used in making this test was a type C, manufactured by the Sandwich Pole Changer Company of Sandwich, Ill.

I notice the articles on phantom circuits in TELEPHONY. You give as your opinion that a ground line, phantomed, over a metallic, would not be much of a success. That it is a hard matter to keep metallic balanced, or to know just where to wind the duplex coils; that coils will cost about $16.00, etc. We have a metallic line two and a half miles long, not transposed, which crosses the street railway. We run a ground line, four miles up to a metallic and duplexed metallic line. The metallic is a private circuit to a manufacturing concern and ground has nine rural patrons. The metallic is perfectly quiet and the ground works well, except the ordinary disturbance of ground circuits.

The coils for a ground phantom can be made for less than $2, not considering labor, which is very small. To phantom for metallic costs about double that of a ground. We have no interference, unless the metallic is talking to a ground, at the same time the phantom is in use. This we remedy by using our repeating coils, which are connected to our cords, connecting the metallic with ground

through them. Otherwise there is bad cross talk between them. We employ four coils, two on pole and two in office. Each coil is 1,000 ohms. The two coils are in series, the phantom is taken off at the neutral point or half way between the 2,000 ohms (this is important) which leaves 1,000 ohms on each side. We have made this a success, as far as a grounded circuit can be a success and we knew that you would be interested, therefore this letter.—J. W. S.

I wish there were more Scotts. We could then have some more experience meetings, and the readers would have many minds to answer this much mooted question. If anyone else has had experience in this work, let him speak out. These columns are for the readers, and I know Telephony would rather you would talk than me.

I note in your questions and answers, in answering the question with reference to a ninety-five mile grounded No. 10 galvanized wire, you state that if a fellow had salt water grounds or something better, the line might be quiet. I do not want to criticize this, but might mention that being in the Puget Sound country, we have lines which are quite long, running through a wild country which has not as yet been visited by electric light plants, and find that by connecting with the salt water at both ends the resistance is negligible and the transmission is absolutely quiet and just as good as if the line were but half its length, as near as we can tell. In fact, the transmission on these lines is so fine that it is not advisable to change them to metallic lines until forced to do so by disturbances which will come when the country grows up. In fact, the cable ship disregards the resistance in salt water in testing for trouble by direct test through the conductor and back through the salt water to the ship, in making locations for grounds on the Alaska cable. I have been up against some of the difficulties you speak of in a dry sandy soil and certainly appreciate a salt water ground.

I have also been attempting to talk through some of the submarine cables which have a capacity of one-half M. F. per mile and have succeeded in talking thirty-five miles, although the thirty-five mile cable was not a commercial transmission. The waves are very perceptibly flattened out by the capacity, although the circuit used was central energy. This was done purposely to keep the potential of the cable practically the same, simply varying it through the speech of the transmitter. Local battery instruments have not been successfully used on this cable, and I attribute it to the high electromotive force and alternating character of the current. There is one cable which is eight miles long on which the transmission is almost as good as city lines. Unfortunately there is no cable accessible at the present time between these lengths, and we are not able to tell just what the longest length would be for commercial transmission with this capacity.

If you have any suggestions as to the possible scheme of connections in order to sharpen up the voice current, I would be very glad to have it, and we can try it on the thirty-five mile cable and see if we can improve the transmission. This is simply an experiment and the information might be quite valuable.—J. B. M.

Here is a contribution from one of our best telephone workers. He finds salt water a good conductor. If he will look closely at the answer mentioned he will find that I did not say the line might be quiet. I said that if a grounded circuit had salt water terminals it would be as good or better than a metallic circuit.

Wireless telegraphy by fresh water has not been a great success. By land, the DeForest system sends long distances. A test made from St. Louis to Chicago came in as clear as was possible. There was no reason why another 300 miles could not have been included in that transmission circuit. By salt water we have all read of long distance transmission, where a steamer is never out of wireless range. It is said that signals were sent across the ocean, but there seems to be a question.

About local battery transmission failing to give satisfaction through the long cable, it seems rather surprising. Local battery transmission has an electromotive force about two times that of common battery.

There is no question in long distance overland transmission that local battery is more efficient. It must be due to more energy being impressed into the circuit, and this would indicate that the cable condition would find local battery superior. But experience denotes otherwise. If two condensers were placed in a local battery circuit, between the instrument and each wire, we would have some common battery characteristics. This would cut down the E. M. F., and impress ordinary common battery voltage.

The only way to sharpen up the voice current would be to cut in the proper inductances, like the Campbell coils, which the Bell company are putting in on their underground cable toll lines between New York and Philadelphia.

Sometimes a little self-induction accidentally strikes a balance with the capacity. But not often. I once found a line through a long submarine cable, which was helped by a repeating coil. This inductance seemed to be just what was needed to tone up the normally flattened-out voice currents.

I hope the test for transmission will soon be made, so that you may find out the limit of cable talking. In some of our large cities it has become a problem. When one has a ten-mile trunk cable and subscriber lines each six to eight miles long, and in cables, it gets serious for subscriber to get satisfaction at twenty miles. I am afraid that they don't sometimes.

NEW PROFESSOR OF TELEPHONY AT PURDUE.

Arthur Bessey Smith received his technical education in the University of Nebraska at Lincoln, Neb., graduating in 1901 with the degree of Bachelor of Science in Electrical Engineering. He secured a position at once as troubleman for a small telephone company in western Iowa. Soon he became troubleman and later inspector for the Nebraska (Bell) Telephone Company at Omaha, from which he was transferred by the same company to Tecumseh, Nebraska, as local manager of the exchange at that point. From Tecumseh he was called to be assistant manager of the Woodbine Telephone Company, Woodbine, Iowa, which position he held for over two years. His next move was to Amsterdam, N. Y., where he was in charge of the newly constructed plant of the Automatic Telephone Company, superintending the operation of the company's all cable common battery system. In September of last year he accepted a position at Purdue University, LaFayette, Ind., in charge of the department of telephone engineering.

Arthur Bessey Smith.

Mr. Smith's first work in the telephone field was done about 1894, when Independent apparatus was crude and elementary. His practical experience has been exceedingly varied. He is a member of the Sigma Xi, associate member of the A. I. E. E., and was a member of the International Electrical Congress at St. Louis, 1904.

The pope has adopted the telephone habit. The vatican is now as elaborately wired as any great financial institution or hotel in the United States—house, local and long-distance telephone in every room. The long-distance telephone most often used by the pope is the wire connection with Venice, his old place of residence and useful activity. From Venice comes stories of all sorts of people who are occasionally called upon by Pius for a moment's chat or some personal instruction.

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EDITORIAL DEPARTMENT

THE NEW YEAR.

TO TELEPHONE men the world over the New Year opens with abundant promise of prosperity. At no time has there been so much activity among the operating companies, and many of the manufacturers and dealers are compelled to work their plants overtime to keep up with the demand. A glance through the department "Progress of the Month" in the back pages of this issue will give an idea of the vast amount of new work going on, and the improvements and extensions of existing systems. Prosperity is abroad in the land, and Independents will receive their share of it during the coming twelve months. To everyone interested in telephone work we wish full measure of all good things and a happy New Year.

ONE HUNDRED FIFTY MILLION DOLLARS.

THE American (Bell) Telephone and Telegraph Company in order to secure the capital necessary to the "proper expansion of its business" is planning the issue of $150,000,000 convertible bonds, such bonds to be sold from time to time as the needs of the concern may require. The Bell company will find use for this enormous amount of money and more beside if it can delude the investing public to supply it. The Independent movement has made such inroads into the Bell field that it is a hopeless task for it to continue under the existing conditions, and a seemingly impossible proposition to change them. The whole Bell fabric is built on fallacious lines. It is impossible for the Bell companies to reduce rates to what they ought to be and still pay dividends on their heavily watered stock, while if they do not reduce their exorbitant rates, it will be impossible to continue doing business. The issuing of bonds is simply a makeshift and can do no permanent good. It is a question among well informed telephone men, as to whether the Bell bonds can be sold. The scheme has been tried several times within the past two years and each time failed. Even a loan was turned down by both the New York and Boston financiers. The investing public is using more discrimination in selecting investments, and where the proper investigation is made Independent bonds are purchased and the Bell issue is left severely alone. This attempted bond issue shows that "somebody is frightened" and should the sinews of war be not forthcoming President Fish will find his company in a bad way for funds.

Time was when Bell bonds were taken up greedily by investors everywhere. To-day they are a drug on the market and are likely to remain so.

DIGEST OF LEGAL DECISIONS.

IN THIS issue of TELEPHONY is presented a digest of telephone law prepared by Gilbert W. Hand, which covers the important decisions of the past several years, with all essential citations. This compilation was made necessary by the many letters received by this publication asking for advice on legal matters pertaining to telephony, and the work of answering these requests, in most cases, by mail, grew to be so burdensome that it was thought advisable to have prepared for TELEPHONY's readers a digest of all the more recent and vital decisions affecting telephony, so that telephone men might have a record on hand which would cover almost any case arising in the ordinary course of events.

Mr. Hand was splendidly equipped for work of this kind, and devoted a great deal of time to the compilation of the digest, which, we trust, will be of some value to each one of our readers.

Of course cases may arise, which are not covered by the decisions contained in this digest, in which event subscribers are requested to write the legal editor of TELEPHONY for advice, which will be rendered without charge in all cases except where deep research must be made or additional counsel consulted. In which event the inquirer is

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advised and the suggestion made that the matter be taken up by his own personal counsel.

We are glad that so much interest is taken in TELEPHONY'S several departments, and we are anxious to establish a still closer relationship.

TELEPHONIC PROPHECY.

WE ARE accustomed to think of the present form of telephone exchange construction and operation as being of recent origin, since the telephone exchange is the most convenient and generally satisfactory way of extending the uses of the instrument to those who may require it.

As another instance that the development of social and commercial convenience proceeds along the line of earlier thought, it is interesting to note that one of our American literary persons, born in the first decade of the last century, writing about the close of the civil war, introduced as an apparent commonplace in one of his stories, the following prophetic paragraph.

The story had to do with various human phases, one of them being a work entitled "Thoughts on the Universe," in contemplation of revision by one of the fictitious characters of the tale. He says in his memoranda concerning the revised edition:

"Put in my telegraph project. Central Station. Cables with insulated wires running to it from different quarters of the city. These form the centripetal system. From central station, wires to all the livery stables, messenger stands, provision shops, etc. These form the centrifugal system. *Any house may have a wire in the nearest cable at small cost.*

When one contemplates the exactness in which the preceding foreshadowed the coming of the central-office or central station arrangement, the light hearted prediction of a widely extended use of telegraph facilities, and the slight difference in actual service between the telephone as it is, and a highly organized telegraph, one is inclined to wonder whether, after all, the immense energy which has been required to reach the present development has not been wasteful, as compared with the efficiency which might have been enjoyed by a single, well trained mind, backed by ample resources.

THE ELECTRICAL EXPOSITION.

TELEPHONE men visiting the coming Chicago electrical exposition, which will be held in the Coliseum from January 15 to 27, 1906, are invited to make TELEPHONY'S booth their headquarters. It will be located in Section B, No. 6, the first booth in the electrical press row. Every convenience will be provided for the comfort of visiting telephone men, and they may have their mail addressed direct to the Coliseum in care of TELEPHONY.

This show will unquestionably be one of the most important ever held in this or any other country. No efforts are being spared toward making it as broad and complete as possible, to give visitors a comprehension of the present high development of the electrical science and an understanding of the manifold ways in which electricity serves mankind. It has been decided to make the opening of the show Monday night, January 15, a formal affair, admission to be by invitation only. Arrangements are being perfected by which the thousands of lights in the big building will burst into a glorious brilliancy upon receipt of a wireless telegram from President Roosevelt. Greetings will also come in an aerogram from Thomas A. Edison. The exposition bids fair to be the most extensive one of the kind ever held in America. Nearly all of the space has been sold.

Manager Mercain is in receipt of a communication from Dr. De Forest stating that he will establish a temporary station in the Coliseum during the two weeks of the show and to demonstrate the practicability of his wireless telegraph service will accept a commercial business from this point to Kansas City, St. Louis and New York City. Dr. De Forest will also make some tests which, if successful, will show startling results in speed and accuracy in the transmission of messages.

The various telephone interests throughout the country have taken an unusually keen interest in the coming show and much that is new in telephone inventions will be shown. Prominent telephone men from all parts of the United States will attend the show and three days—January 22, 23 and 24—have been set aside as "telephone" days. During the exposition there will be three conventions at the Coliseum—the Northwestern Electrical Association, the Electrical Salesmen's Association and the Credit Men's Association of the electrical trades.

It is believed that the Art Institute poster competition has given the electrical show the handsomest poster for advertising purposes that has been distributed by any of the annual Chicago shows. Three designs have been accepted —one for window posters, another for bill-posting and a third for the catalogue cover. The show will be something long to be remembered and no electrical or telephone man should miss it if it is possible to attend.

MR. JOHN HESKETH'S REPORT.

ONE of the keenest pleasures experienced by many telephone people in the United States during the World's Fair year was in their contact with a technical representative of the Australian government who visited the Fair and the electrical congress, as an incident of a trip of investigation around the world. This man was John Hesketh, whose contributions to human knowledge and thought have been noted with pleasure and with interest in these columns. It was he who determined unknown facts concerning the destruction of lead-covered aerial cables in his own country and made them freely known to his brethren in other regions.

Some of the things which attracted commercial and technical men to Mr. Hesketh were his pleasing personality, his keen interest, his close observation, and his undeniably sound judgment. Coming from a country in which the operation of telephone and telegraph interests is wholly governmental, and in which the development of the telephone industry is as yet not sufficient to the public need, the Australian representative found it expedient and entertaining to inquire into all phases of telephony not only in America, but elsewhere. His report to the Parliament of the Commonwealth of Australia lately has been printed, and copies, by his courtesy, have reached this country. A study of the document is not only entertaining but instructive on matters which have to do with our own situation. He treats in a broad, and where necessary in a detailed, manner, the general questions of telephone development and methods of charging for the service given; of the utility and allowability of party-lines and of message and flat-rate systems of charging; of construction methods and construction costs, and of that highly important but woefully neglected element, a standard of transmission.

Relative to telephone development it is interesting to observe that the percentage of telephone to population is, in Australia, less than two per cent. In considering the various means by which this development could be increased to a point more nearly equal to the real requirement, Mr. Hesketh has concluded that the adoption of party lines, with selective ringing and without, is an absolutely essential step.

He concludes likewise that no flat-rate system can be maintained as the generally exclusive method for his Commonwealth. but recommends a method involving the use of a fixed annual charge with a payment per call thereafter.

This is the more interesting when it is observed that the rate per call is but one cent and that the basic fixed charge for the larger cities is recommended as not over $35.00 per year, graduating down to $17.50 on four-party circuits.

He agrees with engineers elsewhere in the belief that a country may well be gridironed with large trunks (long distance circuits) supplied with their traffic by means of smaller and cheaper, but efficient and well-placed feeder circuits. He concludes that the axiom relative to long-haul business in America is applicable to Australia,—viz.: that the toll lines pay the dividends.

Relative to transmission standards he brings to our minds the fact that the situation of all countries is not as ours, where the distances are magnificent, and the maximum present talking possibility much more limited. In Tasmania a standard of maximum 200 mile transmission is anticipated to be satisfactory, and in Hobart also lines over 200 miles long would be extremely rare.

For the heaviest circuits in Australia proper, Mr. Hesketh now recommends a maximum limit of an 800-mile standard.

One of the most difficult problems of the present time, not only to an Australian but to an American as well, lies in the consideration to a conclusion of the automatic versus the manually operated central office equipment. It is not seen from Mr. Hesketh's report that he took from this country, or any other, facts enough to enable him to rule upon the thing now and for all. But his temporary convictions are all the more interesting because it is less likely he is deceiving himself than are we. His attitude toward an ultimate automatic system on the whole appears to be one of great hopefulness. There is food for thought in his comment that a great difficulty of automatic apparatus, however, lies in its inability to complete busy-calls, which he considers an important and indeed an imperative duty of the operating force in any well-managed manually operated system.

THE VALUE OF THE TELEPHONE.

WHILE it would not be impossible to do the work of the world to-day without the telephone, its abandonment would greatly disarrange existing business arrangements.

The latest census of the business reveals the fact that more than 4,000,000 telephone instruments are now in use in this country. This is a remarkable showing in itself, and all the more when it is reflected how short has been the lapse of time since the invention was announced.

Their introduction has revolutionized the methods of doing business already, although it has come about so gradually that it has failed to make a commensurate impression. Taking into account the saving of time and the advantage of a personal interview, there is no substitute for it, for people that are separated by any considerable distance.

That is the reason why its use has become so common, comparatively speaking. The business of operating such an enterprise, leaving out of account the manufacturing feature of the matter, requires the attention of about 125,000 wage earners. Add to this the factories devoted to the manufacture of wire, and the machinery for this business and the draft upon the pole business for its part of the equipment, and a considerable increase in industry is made.

Compared with what have heretofore been regarded as considerable industries, it is thus seen that the telephone business has become most important.

Marvelous as has been the development to the present, there are those whose judgment may be confidently taken, that the expansion is still in its early stages. It is predicted that the cost of operating may be made so low that few families can deprive themselves of the use of such a great convenience, as has become the case with so many other of the modern conveniences of living.

Of special importance will this become to those who live apart from neighbors. Great as is the boon of rural free mail delivery regarded, it is not to be compared in importance with the convenience that would come from such development of the telephone business that the average resident of the rural communities can feel that he can afford to have the service.

The day is not so far distant when we shall see the almost universal use of the telephone.

THE EFFECT OF COMPETITION.

A STRIKING illustration of the effect of competition upon the manners and methods of the Bell company when opposition appears on the field, or gives notice that it is coming, is afforded by the New York Telephone Company, that has long monopolized the field in New York City. It is shown, more especially in the matter of collecting its monthly bills. Before the Independent company was heard of, the bills were sent out by mail on the first of the month, each bill bearing the legend that prompt payment was imperatively necessary. A few days later a collector called, and pressingly asked for the money. If he was not paid at once, a sharp dunning letter was received not more than three days later. If this did not bring a response at once, a still sharper letter followed, this one containing the information that if the money was not forthcoming in so many days the service would be cut off. All this occurred before the middle of the month. This style of collecting has been bravely altered. The bills come leisurely along the first week of the month, and are left by a polite gentleman, who never whispers a word about payment. If not paid at once, after quite an interval a reminder, couched in the politest language, is mailed, asking a remittance for whatever is overdue, and saying nothing about the advance payment, which in the other kind of collecting was requested in somewhat emphatic terms. To let a bill stand a month is no longer considered a high crime and misdemeanor, punishable with suspension of service. It would seem that the New York Bell is worried.

WHAT BECOMES OF ALL THE TELEPHONES.

SO FAR as the figures are available, there are in use to-day in the United States about 4,000,000 telephones. By and large, it is probable that these are wearing out and going absolutely and finally into a condition of disuse, at a rate not exceeding ten per cent. In other words, 400,000 telephones or fewer are required to be made now per year to replace those which go out of service by deterioration.

A canvass has resulted in disclosing that complete telephones are being made to-day at a rate of not less than 3,000,000 per year, for service in the United States alone. After applying the restrictions of experience and judgment as to the effect of replacements, it seems evident that about 2,500,000 of these are effective in growth to increase the total development.

The population of the United States is now growing at a rate of two and a half per cent per year. There are required, then, 100,000 telephones a year, merely to afford a growth which will keep up the present degree of saturation. But the output of telephones effective for a total growth is more than large enough to maintain the present rate with the growing population, so that there are left effective 2,400,000 telephones per year to increase the degree of saturation.

In short, then, we may expect in twenty years to find the total telephones in the United States something like 54,000,000. This is a ratio of telephones to total population of forty-six per cent.

Doubtless this conclusion will seem to many a prophecy

of unwarranted wildness. Perhaps it is. It might seem so, and still be more modest than the actual performance of the past; but if it is a wild assumption, will some one in a rear seat kindly rise and explain what really is being done with all the telephones that are being made?

CHICAGO BELL TRACTABLE.

THE Chicago (Bell) Telephone Company's franchise expires in 1909 and by the treatment accorded its patrons will have trouble in securing a new franchise. In the past the company has been arrogant and would not treat with the city or its subscribers; a different attitude is assumed now.

Through its general manager, Angus S. Hibbard, the company informs the mayor that it is prepared to enter into negotiations for the reduction of the telephone rates in Chicago and that in any settlement made with the city it is willing to provide that the city shall have the right to purchase the plant for municipal operation at some future time.

Mr. Hibbard also told the mayor that the company was paying the city $50,000, part of the compensation which the city contends is due from the outlying districts and which the company has in the past refused to pay. Mr. Hibbard presented a written proposition, in which the telephone company asks the city council to adjust the question of the future relation between the city and the company.

Following is the communication of the telephone company, which is dated December 18:

To the Honorable Mayor and City Council of the City of Chicago—Gentlemen: The Chicago Telephone Company respectfully requests the city council to enter upon a consideration of questions involved in the relations between the city and the company arising in connection with certain of the ordinances under which the company is now operating in the city of Chicago. On account of the rapid growth of the city of Chicago and the problems arising from the grouping of the population in different localities and of varying densities and as one of the features of such growth and grouping, demands will be made on the telephone company for service much more extended and comprehensive than that now being rendered, the telephone company is desirous of meeting these demands in a satisfactory manner. To accomplish this will require an additional investment of very large sums of money for extensions, improvements and alterations in the present alteration and changes in method of operation.

The company does not feel justified in making such expenditures and changes under the present conditions and as the amount of work involved in proper preparation for future telephone service in this great city is of a character requiring much time for its performance, therefore the Chicago Telephone Company at this time respectfully requests the city council to take into consideration the question of settling the future relations between the city of Chicago and this company.

It is entirely different when the company wants a new franchise; it is very solicitous for the welfare of the city and its subscribers. It would like to maintain its present rate of $175 per year, which enables it to pay eight per cent interest on a capital which is watered to three times the value of its physical plant. The company at present has practically a monopoly in Chicago, and the present mayor is opposed to monopolies. It remains to be seen what will be the outcome of its franchise application.

DO YOUR BUYING EARLY.

MOST of us, having but recently passed through the ordeal of buying Christmas gifts, ought to appreciate more strongly than ever the truth of that old and oft-repeated admonition, "Buy early and avoid the rush." This ancient maxim applies very forcibly to the telephone trade and particularly at this season of the year when the ordering of supplies for spring work should come up for consideration. Procrastination, long celebrated as a thief of time, has stolen many dollars in the past from the pockets of telephone companies whose managers or purchasing agents have not had sufficient foresight. Delays in ordering have cost more money, through late arrival of orders, than interest on the cost of the goods would have amounted to for a period of years.

Early buying as regards almost every article needed for the season's work is good policy. Especially, however, is this true of such supplies as poles. Being of great bulk and necessitating many cars, it is seldom possible to procure satisfactory shipments of poles late in the spring and summer. Late in the season, also, stocks will have been culled over to a certain extent and buyers will not then be able to get as high a grade of goods as now. A week or two lost from construction work on account of non-arrival of supplies entails heavy expense, to say nothing of the irritation it creates and the disarrangement of the season's plans. Therefore, we need hardly say, that every wise telephone man will commence correspondence at once with a view to preparing for his season's needs.

THE DECLINE OF BELL STOCK.

THE *Boston News Bureau* in a recent issue says:

"American Telephone and Telegraph Company stock has of late been persistently under selling pressure in the midst of a generally advancing New York and Boston market. Of late leading bankers have withheld from purchasing this stock except upon decline."

In commenting on the present slump in the securities of the parent Bell company the *Wall Street Journal* says:

"The stock of the American Telephone and Telegraph Company at the present level of about 135 yields the investor approximately 5.5 per cent. This level is the lowest the stock has reached for more than a year. In 1904 toward the end of the year, it worked up to 149¼, and the highest price in 1905 so far has been 148, which was recorded in January. The stock, in this time has, therefore, receded in price fifteen points."

When two of the most prominent financial journals in the country comment on the decline of this stock, when the tendency of all the other listed stocks is upward, it looks very much as though the conservative New Englander was unloading his Bell holdings. If Bell stock were a desirable investment there would be no decline. If it was an investment of ordinary value even, the upward tendency of the other stocks would advance it a little, but when it goes down in value month by month with no upward reaction the value can not be there.

There seems to be a general movement to unload Bell securities of all kinds, and how long the once proud monopoly can exist is a question. Surely the Bell outlook is not bright.

TELEPHONE EXCLUSIVENESS.

ONE way of getting an interview with a man who, on the ground that he is overwhelmed with business or some other equally serviceable excuse, refuses to see you when you call at his office, is to call him up on the telephone. This method is known to all sorts of persons who have had much experience in interviewing busy men, and it has served well.

The "buffers," whom many men of large affairs retain in their offices to protect them from the importunities of the public, are generally successful in saving their employers much time and worry, but heretofore a call on the telephone has generally brought the great man himself to the other end. Now, however, this is changing, and many secretaries, buffers or other office employes who answer the telephone calls are instructed to get the name of the person calling, and then, if it is some one of no importance or of unknown mission, to say: "Mr. Blank never comes to the telephone. If you will tell me the nature of your business I will make an appointment with him for you." This method of protection from the telephone is now getting common.

NATIONAL-INTERSTATE EXECUTIVE COUNCIL MEETING.

AT THE meeting of the Executive Council of the National-Interstate Telephone Association held in Cleveland, Ohio, November 24th, the following gentlemen were in attendance:

James B. Hoge, president, Cleveland, Ohio; Theodore Cary, first vice-president, Macon, Mo.; Jas. G. Splane, treasurer, Pittsburg, Pa.; Colonel J. D. Powers, Louisville, Ky.; Ed. L. Barber, Wauseon, Ohio; Chas. C. Deering, Boone, Iowa; Geo. W. Beers, Fort Wayne, Ind.

Letters were received from Mr. John Van Liew, second vice-president, Los Angeles, Cal.; Mr. Richard Valentine, Janesville, Wis.; Mr. C. E. Wilson, Philadelphia, Pa., and from Mr. A. L. Tetu, secretary of the association, Nashville, Tenn., regretting their inability to attend.

Mr. Hoge presided at the meeting; Mr. J. A. Harney acted as secretary.

A brief review was taken by the members of the council of the work accomplished by the association, and the Independent interests of the various states since the June convention. Reports were presented showing that associations have been formed, and others were at present under way in a number of states that until this year had never realized the importance or necessity of organization. Several states have changed from former plan of organization to the National-Interstate district plan, finding this much more effective. New capital has been induced to enter the telephone field, and is being used to develop new territory, and make necessary changes and extensions in the crowded districts. Franchises have been or are being secured, and arrangements made to build practically all of the important cities of the country at present having no Independent exchanges. A remarkable growth is apparent in the long-distance lines especially; Independent companies in the various states reaching out as rapidly as possible to close up existing gaps between themselves and other Independent companies. The various state associations are in a very healthy condition, and are constantly increasing their membership. On the whole, the general outlook was never more encouraging than at present.

The members expressed themselves as being well satisfied with the progress made by the association in its efforts to secure more perfect organizations in the various states, and also of the work accomplished by the draughting and supply departments since these were established. They considered the supply department as the best possible means of thoroughly introducing the standard toll sign and official shield in its various forms, and recommend that this department be given the hearty support of the Independent people. They also urge that all companies operating toll lines furnish the necessary data to the draughting department for the state maps, which the association is preparing, and call the attention of all Independent interests to the great value of these maps.

The following permanent committees were decided upon:

Standard forms of accounting—five members.

Standardization of equipment—five members.

Standard operating rules and regulations—three members.

Qualifications of a number of probable condidates for these committees were then discussed, and taken under advisement. The names of the committees will be announced later.

A number of invitations from various cities desiring the next convention were read and discussed. St. Louis was selected as the site for this convention, which will be held some time in June, 1906. To the president was left the matter of arranging the necessary details. The exact date, etc., will be announced later.

Resolutions were adopted tendering the Independent telephone journals a vote of thanks for courtesies extended by them to the association since its organization. Copies of such resolutions were forwarded to the various journals.

The following brief memorial prepared by the committee appointed for that purpose was then presented by Mr. Barber, chairman of the committee, and unanimously adopted:

William B. Barnard, an honored member of this association and one of its executive council, died on the 16th day of October, 1905, in the prime of life and in the midst of his usefulness. During the brief time he had been connected with this association officially, owing to his illness (which proved to be his last) he had not been permitted to take active part in its deliberations and work. His willingness, however, and his readiness to assist was always manifest and pronounced.

He was a persistent worker and the expansion of the business and development of the United Telephone and Telegraph Company, of which he was vice-president, was in no small measure due to his tireless efforts and his faith in the Independent movement. In the death of Mr. Barnard the Independent telephone movement has lost one of its most loyal and tireless adherents, the United Telephone and Telegraph Company a zealous and able officer, and this association a loyal friend and wise counsellor; therefore be it

Resolved, That the members of this association, by this means, extend to the family of the deceased their sincere condolence and sympathy and that a copy of this resolution be spread upon the records of the association to stand as a feeble expression of our appreciation of the qualities of mind and heart of the deceased as long as the association may continue, and a copy of the same be transmitted to his family.

Ways and means were considered for raising the necessary funds to continue the work of the assocaition, and a committee was appointed to carry out the details of plans adopted.

At the meeting of the Committee on Litigation and Legislation, the following gentlemen were present:

Dwight E. Sapp, Mount Vernon, Ohio; Breckinridge Jones, St. Louis, Mo.; J. B. Ware, Grand Rapids, Mich.; Edward E. Clement, Washington, D. C.

A letter was received from Mr. O. F. Berry, Carthage, Ill., stating that a very urgent matter coming up quite unexpectedly prevented his attendance.

Mr. Sapp presided at this meeting, Mr. Clement acting as secretary.

The following recommendations in regard to territorial disputes between companies were presented by this committee to the executive council, and adopted unanimously by that body. The executive council also instructed the secretary to send copies to the secretaries and presidents of the various state associations.

It is recommended that disputes between companies of the same state should be settled by an arbitration committee appointed according to rules adopted by the state association; such rules to be of a character which will enable either party to a dispute on his own initiative to invoke the action of an arbitration tribunal.

Appeal from the decision of any state arbitration tribunal to the National-Interstate Telephone Association should be filed with the secretary of the state association within thirty days of the decision and should be allowed only upon an affirmative majority vote of the executive committee of the state association properly certified by the president or secretary thereof.

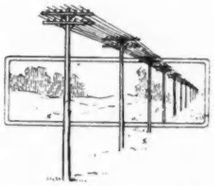
After such approval, all the papers should be promptly transmitted by the secretary of the state association to the president of the National-Interstate Telephone Association and thereupon the executive council thereof acting in conjunction with the committee in litigation and legislation, should decide whether or not the appeal shall be entertained, and in case of an affirmative majority vote, should proceed to appoint an arbitration committee to hear and decide the questions involved.

Such decision should be final and binding in all cases, due notice having been given all parties of the hearing, and should be certified by the president of the National-Interstate to the state association from which the appeal is taken, for action in accordance therewith.

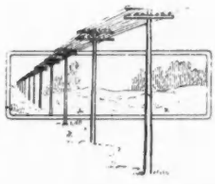
Regarding disputes between companies in different states. Complaints should be made to the respective state associations, and in each case the respective executive committees of the states concerned should each designate an arbitrator, and the two so designated should select a third, these three to constitute a tribunal to hear and determine the matters in dispute, certifying their decision to the presidents of the state association. Appeal from such decision should be taken through either of the state associations involved in the manner and subject to the conditions hereinbefore suggested.

A number of other matters were taken up by the committee on litigation and legislation, but no definite action taken at this time.

The meeting of the executive council and committee on litigation and legislation extended well into the evening.



A UNIQUE TELEPHONE STREET PARADE



Earl C. Long

WE HAVE had frequent occasion to note the value of publicity as an aid to Independent telephony. Activity in that direction is as healthful in this as in any other legitimate business, and when the showing is based on fact, publicity is most effective.

A recent instance of effective advertising is suggested by the accompanying photographs, taken during and at the close of a parade through the streets and around the public square of Quincy, Illinois. The parade was held by the local Independent telephone management at the successful end of the laying of the extensive underground conduit system of the Quincy Home Telephone Company by the firm of McMeen & Miller, Chicago telephone engineers.

The plans for the system as a whole contemplate a structure as complete and thorough as the underground system already is, this part of the plant being larger, relative to the city's area, than the conduit system in any American city so far equipped.

The parade included the total group of people on the active outdoor work, and they were marched from the place of finishing the conduit lines on the day of the parade, through the streets in the following order:

Sergeant of Quincy police force, mounted; squad of mounted police; Markee brass band; squad of footmen, each bearing a large metal street sign in the form of the shield of Independent telephony, and further marked with the imprint of the Quincy Home Telephone Company; tally-ho coach carrying officials and employes; carriages containing Charles Wheat, general manager, his associates and well-known citizens; engineers and foremen, mounted; 100 workmen carrying picks, shovels and Independent shields; twelve construction wagons; fifteen workmen pushing wheelbarrows; gasoline engine and mechanical concrete mixer; rubber tired runabout; wagons carrying hot water boilers used in concrete work, wooden cross-over bridges, tents and street houses, vault forms and manhole covers; 100 men with lanterns, tampers, shields and paving hammers; five-ton roller, drawn by six horses; wagon with cable-

Construction Crew on Parade and Wind-Up in Front of Telephone Building.

drawing mechanism; engine and air-compressing outfit, with compressed air hole-digging, tamping and drilling tools.

Interspersed through the columns were banners, some of them reading as follows:

"To make an omelet you must break eggs; but omelet am good." This was carried by a colored gentleman. On the

reverse side was painted: "To make a conduit you must tear up the streets; but the conduit makes a city." Others read, "Eight miles of conduit and one hundred manholes in sixty days," "$2,000 paid to Quincy's workingmen last week," "Forty miles of tile laid in sixty days," "Everything bought in Quincy except tile."

Bringing up the rear on horseback was the colored janitor of the headquarters building of the company.

Thirty-five per cent of 200 carloads of material to be used in the plant have already been received.

The central office building is shown in the background of one of the accompanying photographs, and its final form in the perspective drawing. In several ways the building is unique among central office houses. It was originally occupied as a residence, finding itself, like many other of the early substantial houses in American cities, in the middle of the town by the growing outward of the intense business center. The building, before its rearrangement, was one of the rare type of solid construction, built by an English physician for a long and useful life. Its walls are three feet thick at the base and its other features are in keeping. Like Independent telephony itself, it stands four-square to the world, and when the company's name is illuminated at night by lamps concealed in the cornice above, the building's imposing front will furnish a constantly active element of effective advertising.

The plans for the complete conversion of the residence building into a modern central office were drawn by Mr. George P. Behrensmeyer of Quincy, under the direction of the engineers. They have enhanced rather than diminished the excellent Colonial outlines of the building.

It is anticipated that the entire system will be completed within 150 further working days, and that the extensive local service established at the beginning of the summer will be supplemented by a long distance network, for the first time properly supplying Quincy with outside communication.

The Quincy newspapers, from which we gather our facts as to the telephone parade, are interestingly unanimous in their recognition of the enterprise displayed by the Home Telephone Company and by Messrs. McMeen & Miller, the engineers and constructors.

ENGLISH TELEPHONE NOTES

By James Hanmer Quail

POSTOFFICE AND TELEPHONES.

Officials of the British postoffice are already preparing for the time when the telephones of the United Kingdom will come under their control. Latterly, business in the telegraph department has languished owing to the greatly increased use which has been made of the telephones. Business has therefore been quiet in the instrument rooms of the head postoffices in the larger cities, while in the telephone departments it has become more active. Operators have therefore in some cases been transferred from telegraph instrument rooms to the telephone rooms to lighten the load on the old members of the telephone staffs. A general coaching of girl telegraphists in telephone work has also begun, evidently with the intention of preparing them for the new branch of the business. Amongst the operators the requisition that many of them shall learn the work of the telephone department has caused a good deal of dissatisfaction, as the girls have preferred the work of the telegraph to that of the telephone, and take to the latter with anything but avidity. The very potent fact, however, that the business in the telegraph department is not increasing while that in the telephone department is increasing rapidly, and possible eventualities in connection with the transfer of the National Telephone Company's business to the postoffice, cause the girls to take to the new work more rapidly than they otherwise would have done. It cannot be said that they take at all kindly to it, but it is expedient that they should take to it and accordingly do so. The old preference for the telegraphs will gradually disappear under the increasing importance of the telephone. This is the rising branch. The telegraph is likely to be a waning branch, which makes a great difference in the estimation of members of the two services.

HULL TELEPHONES: A GOOD START.

The municipal telephone department at Hull, England, has had a prosperous half year. At a recent meeting of the telephone committee, Mr. John Brown, chairman of the committee, reported on the working of the department for the six months which ended on September 30 last, and showed that it had become a paying branch of the corporate estate. An unlimited service had been given for a subscription of $30.68 and use had been allowed in private houses for $25.57. The committee estimated that owing to the cheaper service; the ordinary service of the National Telephone Company costing $48.70 per year. The telephone users of Hull had been saved something like $50,000. Advocates of municipal telephony view this result, and the results at Glasgow, as confirming their own declarations as to the value of municipal telephones, and view the arrangement between the postoffice and the National Telephone Company with regret. They believe that municipal telephones could have been worked profitably and would have been greatly to the public advantage. This much is certain: Wherever municipal telephones have been established, there the public have enjoyed a useful telephone service for little

more than half of the fee charged by the National Telephone Company. Hull, like Glasgow, has proved that the departments can be worked at a profit on the reduced subscription. Supporters of the National Telephone Company affirmed that it was not so. Meantime, the Glasgow and Hull telephones worked quietly on and earned profits while at Glasgow a big business was formed in a marvelously short time. But for the action of the postoffice with regard to the National Telephone Company there would soon have been a large expansion of municipal telephony in the United Kingdom. Town councils were in a mood to establish municipal telephones. Progress in that direction has been effectually stopped by the bargain with the National Company. Advocates of municipal telephony regard Hull with satisfaction and regret. The town has shown what might have been done generally, and has reminded them of what cannot now be done owing to the government's undertaking to buy the National Telephone Company's business.

HYGIENIC TELEPHONES.

The latest thing in telephone equipment in the United Kingdom is the hygienic telephone. Though the latest thing the hygienic telephone is not exactly a new thing, as patents for "hygienic" features in telephones were applied for some five years ago. The article itself, however, in the form of a completed and usable telephone possessing a feature warranting the use of the term "hygienic," has lately been placed on the market. Two firms have produced telephones of the kind and are now appealing to the interested on the strength of the hygienic feature. Each in constructing its hygienic telephone has aimed at dispensing with the mouthpiece, this being the part of the instrument which, it was assumed, might become the abode of bacilli, and therefore liable to spread disease. The Sterling company's instrument consists of a combined transmitter and receiver, the transmitter being a metal tube tapering slightly towards a microphone receiver of the watch pattern, to which it is attached. The tube forms the handle and is open at the outer end, which is cut on the slant, the slanting edge being furnished with a rim. The user simply speaks into the end of the tube and then applies the receiver to the ear. One of the instruments has neither mouthpiece nor tube. The speaker practically talks to the end of a wire and the words are transmitted. These "hygienic" telephones have decidedly a value. They show that transmitting apparatus may be still further simplified.

TELEPHONES AT CAB-STANDS.

The latest application of the telephone in the United Kingdom is the connecting of cab-stands or cab "ranks" with telephone exchanges. Subscribers have the privilege of calling cabs by the new cab-rank lines, but this privilege only. The telephones are not to be used for any other purpose than the simple summoning of cabs. This, however, will be a great boon to the public.

VICTORY FOR INDEPENDENTS.

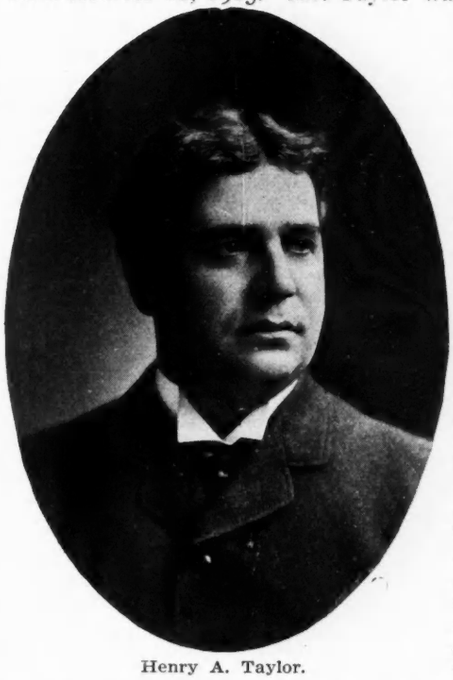
Uniontown, Pennsylvania, capitalists, headed by J. V. Thompson, have purchased the property and rights of the Carmichaels Telephone Company at Carmichaels and Jefferson, Green county. The acquisition is counted on as a big victory for Independent concerns in that section, owing to the fact that the Bell company succeeded recently in purchasing the property and rights of the South Bend Telephone & Telegraph Company.

Aside from obtaining the exchanges the company by the contract comes into possession of the franchise for an exchange at Waynesburg, which was granted in 1897. The Carmichaels company had toll lines to Masontown, Fayette county, and within one mile of Waynesburg. The loop will be completed and the exchange at Waynesburg will be built at once.

The new company will affiliate itself with the Pittsburg & Allegheny of Pittsburg, the Tri-State Company of Uniontown and the National company.

DEATH OF HENRY A. TAYLOR.

It is with regret that we announce the death of Mr. Henry A. Taylor, which occurred at Lafayette, Indiana, on December 18, 1905. Mr. Taylor was born in Lafayette thirty-seven years ago. He was a pioneer in Independent telephone work; he entered the field in 1894 as secretary of the Harrison Telephone Company, and at the time of his death was secretary of the Lafayette Telephone Company and vice president of the Sterling Electric Company of Lafayette, Indiana. He was interested in many Indiana enterprises and had amassed a considerable fortune. His connection with the Sterling Electric Company brought him into contact with telephone men all over the United States, who were drawn to him on account of his affability. Our condolence is extended to his family and business associates.



Henry A. Taylor.

OFFICIAL BULLETIN NUMBER SIX.

In the sixth bulletin issued by the National-Interstate Telephone Association attention is again called to the necessity for the co-operation of Independent telephone men in the compilation of the association maps.

The purchase of the official shield design, directory cover, and lapel button is urged, and the following warning to Independent exchange owners is given:

"Give no option on your plant to any individual, firm or corporation until absolutely sure that such option is not being secured by agents of parties unfriendly to Independent interests. It has been a common practice of these parties in the past to secure such options for the purpose of using them to intimidate smaller companies in the vicinity of the exchange on which options had been secured; the object being, if possible, to induce such smaller companies to sever their Independent connections. It has usually been found upon investigation that the parties securing these options had no intention whatever of purchasing the plants on which they were given."

SOUTH DAKOTA CONVENTION.

The annual meeting of the South Dakota Telephone Association will be held at Sioux Falls, S. D., Jan. 10 and 11, 1906, with headquarters at Cataract House. A large attendance is expected and from the present outlook, it is believed this will be the best attended convention ever held in South Dakota.

THE DEVELOPMENT AND INTRODUCTION OF THE CALCULAGRAPH

By Henry Abbott

MUCH has been published relating to, and large sums of money have been expended in advertising the Calculagraph, but the story of *how* and *why* this piece of apparatus came to be adopted and to form part of the standard specifications for equipment of telephone toll switchboards throughout the civilized world has never heretofore been written.

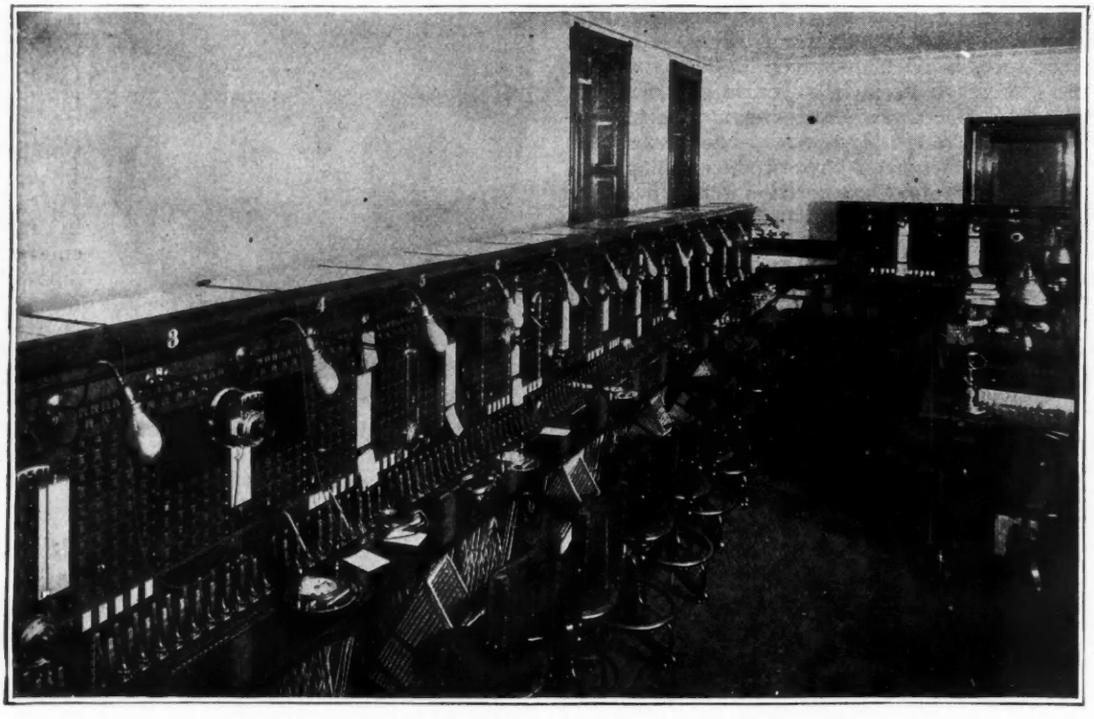
The few readers of TELEPHONY who were identified with the telephone industry prior to 1895, and the still fewer who were then concerned with executive, engineering or operating problems in *long-distance* telephony, may recall the incidents which will be here related, but a gentle reminder of the difficulties of those days will do them no harm.

The majority of the readers of this publication have, doubtless, entered the telephone field since the date named, and to such the story may have an historical interest.

The fact that the Calculagraph is to-day used to compute and record the number of minutes and fractions of a minute that a telephone toll line is used by a customer, and on which record the charge for service is based, in all the toll exchanges of the Bell system throughout the United States and Canada, by a great many of the Independent telephone companies who have toll lines, and by the governments operating the telephone systems in practically all of the European, Asiatic, African, Australian and South American countries, excites no particular notice or comment; no more than does the use of a telephone. So quickly do we adapt ourselves to changed conditions, and so soon are conveniences and luxuries by daily use converted into necessities.

Were we to-day to return to street cars drawn by horses, or were all the telephones now in use throughout the world to be suddenly destroyed, we would then have a fair understanding of the value of electric traction and the usefulness of the telephone, and the two situations would serve as an illustration of what would happen to the telephone business and the public if all Calculagraphs should on the same day be removed from telephone switchboards and if the methods of operating, timing messages and charging for service in vogue in 1894 were restored.

In the early days, the telephone business was a "local issue," and its use was confined to cities, towns and communities; but at the period of which we write, the toll business (long-distance service) had developed to such an extent that it showed signs of growing importance and telephone managers began to sit up and take notice of that branch of the service, though none then dreamed that the toll lines would ultimately prove to be great revenue producers and would furnish material for dividends, while in many cases the local business might be conducted at a loss.



The First Telephone Switchboard Equipped with Calculagraphs.

Very early in the use of toll lines it became apparent that something must be done to improve the method of timing messages, as, when operators at either end of the line noted the time by looking at a clock dial and wrote it down with pencil, their records of time consumed rarely ever agreed, and the use of the line by the two operators at the end of each message to compare notes and discuss their differences and, if possible, reach an agreement as to the amount to be charged for the service, was a very wasteful practice; besides, there was no certainty that any charge was correct; doubts were always resolved in favor of the customer, and whenever one complained of an overcharge, concessions were promptly made, as there were no means for proving the accuracy of the company's record.

All known or available devices for timing, including sand glasses, stop watches and time stamps, were tried on toll messages, and one after another were discarded as unfit for the purpose.

It was at about this time, one hot day in the summer of

1894, the writer, with a Calculagraph under his arm, entered the office of the chief engineer of the American Telephone & Telegraph Company in New York, presented his card and introduced his machine. At the moment of his entry every person connected with the department, including the errand boy, was at work upon or experimenting with some new device or invention for timing toll messages, and fifteen electrically-operated timing machines were fastened in a row against the wall.

The Calculagraph at this period in its evolution was a rather crude affair, resembling in shape somewhat a huge land turtle, having projecting above it three operating knobs. These were struck a blow with the fist, in the same manner that the "time stamp" of to-day is operated, each time a conversation was commenced and finished, and the noise and jar thus produced in the telephones were like that of a sledge-hammer or a pile-driver. After fifteen minutes' use of this machine on a switchboard, the operators threatened to resign in a body, for fear of losing their ear drums, and the customers concluded that a boiler factory had been connected with the telephone exchange and protested in very unchristian language.

Calculagraph Mounted on Pedestal.

Calculagraph Mounted on Bell Long-Distance Switchboard, New York City.

The author of the Calculagraph withdrew into his shell, taking his machine with him, and when it next appeared at the engineer's office, the Calculagraph was provided with levers which were operated silently and without jar or disturbance of any kind. The same have remained a part of the machine to this day.

Further experiments with this second edition of the Calculagraph were conducted in the operating room of the American Telephone & Telegraph Company, New York City, and this experimental use continued through a period of over eight months, during which time very exhaustive tests were made as to accuracy and durability, and changes and improvements were made in the construction of the machine to adapt it to the requirements of the business.

In May, 1895, the first order for twenty Calculagraphs had been executed, and these machines were installed in exchanges of the company at New York, Boston and Philadelphia, and within a year all the toll boards of the company in the country had been equipped with these machines.

The method of timing and charging for toll messages prior to the use of the Calculagraph; some of the experiments made with that machine; the effect its use had upon the service; the changes which were made in the system of operating and of charging for toll service by reason of the use of the Calculagraph, and the enormous saving thus effected to both telephone company and the public, are graphically set forth in the language of the then chief engineer and the chief operator; the latter personally made many of the tests, and later became division superintendent of the American Telephone & Telegraph Company.

Both of these gentlemen were witnesses before the United States Circuit Court in a cause affecting the validity of the Calculagraph patents and their testimony under oath, which is now a part of the court's record, is here reproduced, in part:

TESTIMONY OF THE CHIEF OPERATOR.

In the latter part of 1893 our company desired a better means of timing toll messages and I was detailed to investigate the matter and secure a satisfactory machine. I learned of the Calculagraph and a machine was installed on our toll board and its utility and accuracy demonstrated. It was known that the company was furnishing service which was not charged for, owing to the crude timing apparatus employed, and our first experiment was to determine the amount of this loss and see if the Calculagraph recorded accurately the time the line was in use. A special connection was established between a vacant switchboard position and an outward Boston position, and an operator was detailed to make a listening supervision of the outward operator and of certain of the toll lines which she controlled. A Calculagraph was then installed and results noted. The Calculagraph records were compared with tickets made by the old method of timing, which clearly proved the inefficiency of the old system.

The next experiment made was to place the Calculagraph under the charge of the outward Boston operator, in the New York office, who used it to time all of her messages.

The results of this confirmed the opinion reached after the first test, the additional feature appearing that the operator did better work in other respects when the strain due to being responsible for the accurate determination of the company's revenue was taken off her mind.

The same experiment was then tried on other positions where a different type of service was handled. Laboratory tests were also made of the device; and after careful consideration a number of the machines were ordered from the manufacturer, and were placed in service in a new central office switchboard which was opened about the first of May, 1895.

The use of the machine immediately after that became general throughout the larger offices of the company, and they have since been placed in practically all of the timing offices.

The principal advantages that we found were these: We secured an accurate record of the time of day at which a connection started. We further secured an accurate record, not dependent upon an operator's judgment, of the *elapsed time*. It also developed that by relieving the operator of certain features of the timing work she was enabled to pay closer attention to other important features of her work.

Her work being simplified, she was able, for instance, to more promptly answer subscribers' signals; and, finding that the conversation had ceased, to more accurately record the charge against the subscriber.

The record itself was invaluable for settling claims for rebates where customers claimed they had been overcharged. By explaining to them the method by which the charge was determined, and showing them the record, in the larger number of cases they were willing to admit the probability of the company being in the right.

We were also able to charge two periods for messages which

An Early Calculagraph.

exceeded a period by a very small margin. The use of the Calculagraph brought out the fact that there were a large number of messages which under the existing system were charged as two periods or more, on which connections the subscribers had used possibly only a minute or two excess out of a five minutes period, for which use they were required to pay the full rate for a five minute period.

It became apparent that a very material saving to the customers should be made by a rearrangement of the tariff system. Such a rearrangement, however, was only possible in view of the fact that an accurate timing device was used.

As it was possible with the Calculagraph to record elapsed time in periods of fifteen seconds, the tariff system was changed, and a minute rate was introduced, under which the customer after the first five minute period could talk for one or more minutes, and be charged exactly for the usage of the line at a very low minute rate.

Records were made to determine the effects of this change. It was found that for various reasons the average time consumed per message decreased from approximately five minutes to something less than four minutes; and again the tariff system was changed for the purpose of more accurately charging the customer for the exact use of the line.

This change consisted in the reduction of the initial period from five to three minutes, with a corresponding reduction in the initial charge, and a low pro rata charge per minute for excess time.

The general result of this entire change from a five minute initial period and multiples of five minutes to a three minute initial period and pro rata thereafter was to effect a material saving to the subscriber, who paid only for the actual time used; and it also produced a very heavy increase in the company's revenue by attracting business which could not be secured on the old basis of five minute and multiples of five minute periods.

The loss through reduction in rates was more than offset within a short time by the increased business at the lower rates.

The increased earnings on account of our ability to charge for and collect practically every minute of excess time were also very material.

The increased revenue on account of the stopping of errors made by operators in mentally calculating elapsed time was considerable.

The introduction of the machine also made it possible for us to very materially change the methods of toll line operating, to economize in the operating expenses, and to increase the work of the individual operator along lines which not only improved the character of the service, but increased the net revenue.

These changes consisted principally in the stopping of all inward timing and inward records and the stopping of all comparison of tickets by the operators. Also in the abandoning of elaborate check records made by the bookkeeping department for the purpose of balancing the accounts between the various timing offices.

The operators' work was increased, but along the lines of specialization, and it became possible in many cases to save the expense of a number of operators by working two outward operators against one inward operator.

The chief engineer testified, in part, as follows:

Q. Please explain the present practice in charging for toll services on telephones?

A. Telephone toll service is charged for in accordance with the duration of the conversation; this is one of the elements of charge. The distance separating the people is also another factor in that charge; another factor of charge is whether the conversation takes place in the day time or in the night time, the charge for night service being, as a rule, less than that for day service.

Q. In taking into account the factor of time during which the telephone is in use, is the charge so much per minute throughout the entire conversation, or how is the charge made up in this respect?

A. As a rule the charge for a toll message covers a charge for a certain initial period of conversation, which is usually either three or five minutes, and for periods exceeding this initial period in duration the charge is commonly based on the length of said additional use, measured by minutes. I might say further the initial period most commonly used is three minutes, with an additional charge for each minute's over-use, this over-use being generally at the rate per minute of one-third of the initial rate.

Q. How are toll messages timed in the telephone exchanges of the several companies you have mentioned?

A. In nearly all instances they are timed with a mechanism

The Calculagraph of To-Day.

which we call a Calculagraph. The operator makes a record of the call on a slip of paper, and just as soon as the conversation starts she inserts this piece of paper into the Calculagraph and takes an impression. Just as soon as the conversation is ended she again inserts this piece of paper and makes a second impression of the Calculagraph. The Calculagraph, by means of these two impressions, records the elapsed time of the conversation; in other words, it records the duration of the conversation.

Q. How many telephone lines does one operator attend to, and how many operators use a single Calculagraph?

A. The number of lines which an operator handles varies largely. In some instances one operator handles but a single line, in other instances a single operator handles as many as seventeen lines. It is the standard practice of our companies to provide one Calculagraph for each two operators. Either operator may use the same Calculagraph.

Q. In the preparation and the approval of specifications for toll switchboards, have you at any time specified or approved of a specification for Calculagraphs for use on such boards?

A. I have approved specifications covering the use of Calculagraphs in very many instances.

Q. How recently have you approved such specifications?

A. Within two months.

Q. What proportion of the toll switchboards of your companies are now equipped with Calculagraphs?

A. All of the toll switchboards of the American Telephone and Telegraph Company are equipped with Calculagraphs.

Q. When did you first meet Mr. Henry Abbott, president of the Calculagraph Company, and what were the circumstances attending your first meeting with him?

A. It must have been some time in the fall of 1894 that I first met Mr. Abbott. Mr. Abbott was brought to my office, in New York, by the private secretary of the vice-president and general manager of the American Telephone and Telegraph Company, who introduced Mr. Abbott to me and said that he had a machine for use in our operating rooms which the vice-president and general manager would like to have me investigate and report upon. Mr. Abbott showed me a machine which he called the Calculagraph, which I had never seen before, and explained to me the uses to which he proposed to put it.

Q. Were any alterations made in the Calculagraph after you first saw it before your company began to purchase them and use them?

A. Yes, there were a number of changes made by Mr. Abbott in the machine before we purchased any. The first machine that he submitted was a clumsy affair; you had to hammer it in order to make a record. He changed this and produced a machine which worked with a lever and in a noiseless manner. He also changed the record itself so that intervals as small as fifteen seconds could be recorded. He changed the design of the case so that it could be attached to our keyboards without interfering with our apparatus, and made other trivial changes.

About how much time was the Calculagraph tried and used experimentally by your company before its purchase for regular use?

Calculagraph Mounted on Independent Switchboard, Salt Lake City, Utah.

A. I think we experimented with that machine for about eight months, certainly more than six months, and certainly less than a year.

Q. What were the various methods of timing toll messages in your company's exchanges prior to the use of the Calculagraph?

A. Prior to the use of the Calculagraph each office was furnished with one or more clocks which were supposed to be good time keepers, and which were adjusted every morning, the operator at each end of the toll line would supervise the connection and time it, each operator reading the clock as closely as she could. When the conversation was completed the two operators would compare their time and adjust differences.

Q. In thus adjusting their differences, did the operators use the telephone line for that purpose?

A. Yes. In adjusting differences, and these were of very frequent occurrence, the operator had to make use of the toll line over which conversations took place.

Q. Since the introduction of the Calculagraph, please state whether or not you make records at both ends of a line and whether or not the line is used for adjusting the records at the two ends.

A. Since the introduction of the Calculagraph the timing is performed at one end only, and the line is not used by the operators for the purpose of comparing time records.

Q. Were the observations made from the clock accurate or not?

A. The observations made from the clock were quite inaccurate. A difference of one or more minutes can easily be made and was in fact made by operators, this error depending upon the angle from which the operator looked at the clock.

Q. Has your company ever used time of day stamps for recording the time of messages?

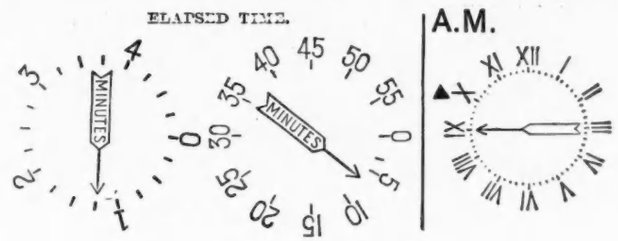
A. Yes, we have used time of day stamps to some extent for recording the time of messages. We never went into this extensively for several reasons, the most important one being that the time of day stamps that were at our disposal at that time would not record the time of day accurately even to a minute, and after the record of time of day stamps was made, somebody had to go over the tickets and make subtraction between the two times, which introduced a source of error. And it was about the time that we were exploiting the time of day stamps that the Calculagraph came along with a record which avoided this additional labor and gave a record down to a quarter of a minute in accuracy.

Q. Has your company ever used stop watches for timing toll conversations? If so, with what results?

A. Our company has used stop watches, horse timers, for recording the time of conversation; not with satisfactory results. These devices were continually getting out of order, and the operators were continually spoiling their record by manipulating the stop watch in an improper manner. Quite frequently they would set the watch back to zero and actually lose the record of elapsed time. That is, the operators were never trained up to using them with accuracy. Moreover, it required a separate stop watch for each line, and in those early days the number of lines to an operator was much greater than it is to-day. Even to-day we find in a certain class of business an operator with twelve or fifteen; in one case I have in mind at this moment she has seventeen lines before her. In order to time those properly she would have to be equipped with seventeen stop watches, which is an impracticable thing to do.

Q. Have you ever made any tests to show the relative accuracy of timing toll messages with the Calculagraph and with the previous methods of timing such messages?

A. I have personally made very many tests of this kind and have had thousands of other tests made by assistants. I remember distinctly of personally making a series of observations where the Calculagraph record was accurate to a quarter of a minute, and in no case was it in error to the extent of three-quarters of a minute. I remember also of making a large number of observations on the old method of timing, and I remember in one case, where the operator at the New York end, where I was making my observation,



A Calculagraph Record.

timed the conversation correctly, but the operator at the other end convinced her that she had timed it incorrectly and the result was that arbitrarily two minutes were taken off of the connection; the service rendered by the company was actually two minutes longer than the two operators finally agreed upon.

Q. Please state a little more fully how those tests were made; that is, how you determined the true time of the message.

A. The true time of a message is determined by locating an observer on a toll line, who has in her possession a head telephone. This observer can overhear what takes place on the toll line. Such an observer is a skilled person and has a stop watch, and in this way determines very accurately the duration of a series of conversations. An observer of that kind can make perhaps twenty-five or thirty observations in a day. The record made by the observer is checked against the ticket record made by the operator, and by comparing those records, the accuracy of the operators' timing can be ascertained.

Q. Were the errors in timing telephone messages by means of the methods used prior to the Calculagraph more often in favor of the company or of the patron?

A. They were more often in favor of the patron. It is a good deal easier for an operator to come to an understanding with a subscriber by taking off a period of time than it is to stick to what her record shows. In the old way the operator controlled the record; in the new way the record is controlled by the machine.

Q. Was any proportion of the revenues of the toll department lost because of the inaccurate timing of messages prior to the Calculagraph?

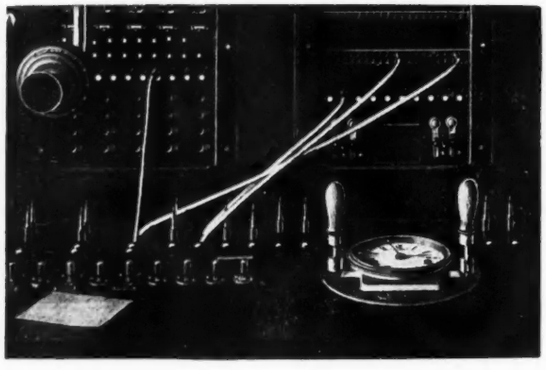
A. Undoubtedly a portion of the revenue was lost in that manner.

The Calculagraph having, by the end of the second year after its introduction, proved its right to be, and, by its usefulness, having established itself as an essential part of the operating apparatus of every exchange of the American Telephone & Telegraph Company, it was thought by its

promoters that all other operating telephone companies having toll lines would promptly fall into line and, without further argument or special effort on our part, would wish to install these machines on their toll line switchboards.

In this expectation, however, we were doomed to disappointment, as, after another year of effort, we had succeeded in placing only a very limited number of the machines with the local telephone companies and those were widely scattered, and, in many cases, not sold, but "on trial" only.

We were, moreover, everywhere confronted by the argument that, "while the Calculagraph might be useful and even a necessity to the long-distance company whose toll lines connected widely separated points, and whose charges for service were of necessity large, so that an error in timing a message would make a very material difference in the amount of charge and would possibly entail considerable loss of revenue to the company, the conditions pertaining to the toll service of the local companies were radically different; their toll lines were shorter, the charges for service were very much less, in many cases the average initial charge being less than twenty-five cents, and if an error should occasionally occur in timing a toll message manually,



Calculagraph Mounted on Toll Switchboard.

the amount involved in such error would be so small as to be practically negligible."

One general superintendent, after much persuading, agreed to the fairness of our proposal that he detail men from his force of inspectors to make a study of the conditions prevalent in the operation of the toll lines of his company, especially with reference to the degree of accuracy with which messages were being timed. A Calculagraph was loaned for use in the test.

The territory covered by the toll lines of this company comprised a group of towns and cities, none of which were more than thirty miles apart; the minimum charge for a five-minute talk between any two points being ten cents, and the maximum for the greatest distance, thirty-five cents. The conditions were therefore typical of a so-called local telephone toll system.

The report made by the inspector who conducted the investigation describes the methods and apparatus employed in making the tests and the results observed. It was signed by the inspector and the traffic manager, approved by the general superintendent, chief engineer and general manager of the company.

The report, in part, was as follows:

In accordance with instructions I have investigated the system of timing checks by the Calculagraph in order to determine the reasons for or against its use on the toll boards of this company.

The refinement of time obtained by the use of the Calculagraph would be of no practicable advantage, except for connections of more than five minutes' duration, because our charges are made for five minute periods.

In order to determine what per cent of the connections were more than five minutes in length, also to determine the importance and extent of defects in the present system, 400 of these connections were timed. Thirteen per cent were from five to ten minutes in length and 6.75 per cent lasted more than ten minutes. The elapsed times on the operators' checks were compared with the elapsed time obtained by "listening in" on the connections. It was found that 59.5 per cent varied less than one minute from the time obtained by listening in on connections. The other 40.5 per cent, which were more than one minute out, were in every case timed in favor of the subscriber; i. e., they were not charged with proper overtime, the operator's elapsed time being shorter in each case.

As it was thought that a stricter method of timing connections would probably eliminate many of the above errors, the manager was requested to instruct the operators to use more care in the timing of their connections.

During this second set of tests the operators were fully cognizant of the fact that their work was being watched and the results probably represent the best work that the operators are capable of doing under existing conditions. Of the 300 connections that were timed, 18.3 per cent were five to ten minutes in length and 4.7 per cent lasted more than ten minutes. As before, the time obtained by "listening in" on these connections was compared with the operators' time and it was found that 84 per cent varied less than one minute, the other 16 per cent being over one minute out, and were in every case timed in favor of the subscriber.

The 300 connections represented a total of 353 charges. Of this number ten charges were lost due to inaccurate timing by the operators. Assuming the same percentages of overtime charges the loss on such charges due to errors in timing being 2.8 per cent as indicated above; the daily toll report shows that the average business per day amounts to about $415. Thus 2.8 per cent of this would mean a loss of $11.62 per day due to errors in the elapsed time on the checks. This is probably a conservative estimate, for the reason that the operators could with difficulty maintain the standard of this set of tests even though they knew they were being watched.

The Calculagraph or any other automatic timing device giving an equal refinement of time has the following advantages over the clock:

1. It eliminates the possibility of personal errors of the operator in noting the time of the check.

2. An automatic machine would reduce the mental labor of the operator, while a clock with a second hand would increase it, as it requires the reading of two dials.

The results indicate that both as regards service and money considerations it would be advisable for the operator to handle not more than five trunks and time the connections with an automatic machine.

This company now has over one hundred Calculagraphs in use on the toll switchboards of its several exchanges.

The general manager of another local telephone company, after much urging, consented to install sixteen Calculagraphs, one each in sixteen of the small exchanges of his territory. After thirty days' use of these machines, he wrote the following letter:

Referring to our conversation in reference to the use of the Calculagraph, I beg to advise that in October last we installed Calculagraphs in sixteen different exchanges, and in making a study of the result of their use we find that during August from these sixteen exchanges we handled 44,845 messages, the total value of which was $9,522.69. Included in this amount were 6,929 excess messages, having a value of $577.50.

During the month of November, which was the first full month these Calculagraphs were in use, we handled from these same sixteen exchanges 43,182 messages, having a value of $11,064.54, included in which amount were 22,846 excess messages, with a value of $1,703.70, or an increase of 15,902 excess minutes, with a value of $1,126.20.

In considering these figures it should be remembered that August had twenty-six working days, while there were only twenty-four such days in November.

We expect to send you an order for quite a number of these machines in the course of a few days.

In analyzing the figures contained in the above letter, it will be noted that the average cost per message was, in August, less than twenty-two cents, and in November, less than twenty-six cents, showing them to be, relatively, "short haul" messages. Also that the increase in receipts in November over August due to accurate timing of messages by the Calculagraphs amounted to an average of $70.39 per machine; or, the earnings of the sixteen Calculagraphs for one month were $1,126.20.

The order promised in the above letter was duly received and executed. It covered one hundred and thirty-eight Calculagraphs. The same company have now in use on switchboards in their several exchanges over two hundred of these machines. If it be assumed that all of these ma-

chines have earned as much as the first sixteen averaged, then the increase in net revenue of that company due to the use of Calculagraphs would be $168,936.00 annually.

The traffic manager of another telephone company observed the operation of a half dozen Calculagraphs in one of its larger exchanges for nearly two years and then reported to the general manager that a single error of one minute on a twenty-cent toll message once each day would represent a money loss to the company sufficient to cover the maintenance, repairs, and interest on the cost of a Calculagraph and set aside in a sinking fund each year a sum sufficient to wipe out the original investment before the machine would be worn out; moreover, in his opinion it would be a cold, bleak day, with "nothing doing" in the smallest and meanest exchange in their territory, when at least one such error was not made under their then system of timing messages; that Calculagraphs would eliminate all such errors, which was sufficient justification for installing them in every exchange where the company handled toll messages. His logic met with the approval of the management, and to-day that company is using in its exchanges 456 Calculagraphs.

Similar experiences and a similar reluctance to get out of the beaten path of operating practice were met with in the case of nearly every one of the licensee companies. Several managers waited four or five years for the price of the machines to get cheaper, and, while waiting, lost for their companies a few hundred thousands dollars' worth of earned toll revenue, but ultimately all were coaxed into line.

While this campaign of education was progressing, the Independent telephone companies began building toll lines (they had been giving local service for several years) and by the time the Bell licensee companies had learned the Calculagraph lesson, a few Independents had quite extensive toll systems in operation.

Effort was then made to introduce the machine into their exchanges, by advertising, by circulars, by correspondence, by personal solicitation, and by all letigimate methods of the business-getter, but the managers of the Independent companies did not take kindly to the Calculagraph.

Many advertised, in their local newspapers and otherwise, the fact that they did not time messages, but permitted a subscriber to use a toll line as long as he wished for a single charge to cover a nominal period of three or five minutes. Needless to say, advantage was taken of such liberal service, and a half hour's use of a toll line for an exchange of gossip was no uncommon occurrence.

Time, however, has wrought many changes, and those Independent telephone companies who did not believe the Calculagraph was a dividend maker have changed their minds and are now making reasonable charges for the service they render.

Those Independent telephone companies who to-day operate important toll lines use Calculagraphs and make accurate records of the time their lines are in use.

All manufacturers of Independent telephone apparatus also furnish toll switchboards designed for and equipped with Calculagraphs.

It would be mere repetition to tell of experiences with officials of the several foreign governments who operate telephone systems under the management of some government bureau or department; but as illustrating well-known national characteristics of conservatism *versus* progress, it may be of interest to note in this connection that representatives of the "Commissioner of Communications" of the Government of Japan placed orders for Calculagraphs, for the telephone exchanges of Tokyo, Osaka and Yokohama, the first time they saw the machines, while it took five years of persistent effort to get the first lot of Calculagraphs installed in the telephone exchange of the London postoffice.

An eminent author has asserted that "a story without a moral must be either pointless or immoral."

Readers of this story are, therefore, licensed to draw from it the following conclusions:

"Conservatism" often costs a lot of money.

Great effort is required to drag corporations and individuals out of the ruts they have worn in the road they travel.

Even a good thing will not walk out and sell itself; some one must push it along.

INDIANA DEVELOPMENT.

Considering the development in the Independent telephone business in Indiana, it is not regarded as surprising that this field has attracted the attention of wide-awake capitalists from outside the state, men of large means known to be zealously devoted to the Independent cause. The tax returns to the auditors of state are indicative of the progress made. While the Central Union (Bell) Telephone Company operating in Indiana, Ohio and Illinois filed a statement sworn to October 10, 1904, with the auditor of the state of Illinois embodying the words, "No dividends paid since 1896 and none in sight." The success of the Independent companies has disproved the correctness of the prediction made some years ago that it would be impossible for the people to rescue themselves from the trust exactions of Boston capitalists and do a successful business at moderate rates. The prediction that the Independent systems could not be brought into a working harmony has also been disproved by the great network of metallic circuits of the New Long Distance Telephone Company and its allied toll lines. The prophecy was then made that long-distance service would be hindered by failing to effect close co-operation with the toll systems of surrounding states. The recent accession of capitalists who have been very successful in Independent telephony in surrounding states will now secure a broader and more intimate union. Long-distance connections for points in surrounding states are quickly and satisfactorily made.

The tax returns of 228 companies in 84 counties reporting to the auditor of Indiana for 1905, with the remaining companies estimated on the same basis, showed a total investment of $11,605,873, an increase of $3,897,242 over 1904. The gross earnings of 1905 were $3,500,000, a gain of 77 per cent over those of 1904. Improvements to the amount of $112,846 were paid out of the earnings, this amount being $42,117 or 60 per cent more than in 1904. The actual gain in net earnings over those of 1904 was $313,042, a gain of 116 per cent. The 368 Independent exchanges in the states are doing a good business. The total number of Independent telephones in the state at the present time is about 175,000. This enormous development has been achieved within six years. There have been fewer failures among Independent companies than in any other class of business. No company has been in the hands of a receiver.

NEBRASKA MEETING.

The annual convention of the Nebraska Independent Telephone Association will be held in Lincoln, January 23-24, 1906, at The Lindell Hotel. There has been much enthusiasm shown among the operators in the state for some time past and an enthusiastic and well attended convention is expected.

CENTRAL ILLINOIS MEETING.

The Central Illinois Independent Telephone Association has been called to meet in the parlors of the Fry Hotel, Peoria, Illinois, on January 5 and 6 1906. It is estimated the attendance will be large.

MANUFACTURERS DEPARTMENT

BLAKE COMPRESSED CLEAT.

Blake compressed cleats are recommended to those who desire efficiency, neatness and dispatch. They are designed for use on all low voltage circuits of interior wiring, such as telephone, telegraph, messenger call, annunciator

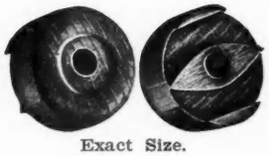
Blake Compressed Cleat.

and bell work where such circuits are run over plastering or other places where Blake staples can not be used.

These are compressed cleats treated so as to be impervious to dampness and moisture.

There is no breakage in the use of these compressed cleats, whereas with porcelain cleats there is a breakage of from twenty per cent to twenty-five per cent between the factory and the installation. These cleats will not break under the blow of a hammer, so that wire nails can be used as well as screws. This enables a saving to be effected in both material and labor.

Blake Compressed Cleats.



Exact Size.

Blake cleats cost much less than either porcelain or fibre cleats. When stringing long runs of wire the end cleats will hold the slack until the wire is secured at intermediate points.

These cleats are meeting with favor everywhere used, and the company will be glad to furnish samples and prices. Address Blake Signal and Manufacturing Company, 246 Summer Street, Boston, Mass.

WARNER ELECTRIC COMPANY VICTORY.

The validity of the Warner Electric Company's pole changer patents was sustained by the United States Circuit Court on November 6, 1905, and an injunction was granted against the manufacture, sale and use of the Illinois pole changer. The suit was instituted by the Warner Electric Company against the Illinois Electric Specialty Company, and was heard before Judge Kohlsaat. The decision in full follows:

"This cause came on to be heard on the 4th day of October, 1905, upon the pleadings and proofs, and was argued by counsel for the complainants, no counsel for defendants being present, and the pleadings and proofs having been duly considered, and the court being sufficiently advised in the premises doth find for the complainants; and thereupon it was and is hereby ordered, adjudged and decreed:

"That the complainants are the sole and exclusive owners of the re-issued letters patent No. 12,162, on an invention in pole changers, issued upon the application of William F. Warner, and dated October 13, 1903, as set forth in the bill of complainant; that the complainants are also the owners of the entire right to recover damages and profits from all infringers of said re-issued letters patent; that the said re-issued letters patent are good and valid in law, and that the said William F. Warner was the original and first inventor of the improvements described and claimed in the said re-issued letters patent; that the said re-issued letters patent have been infringed by the defendants herein, by the manufacture, use and sale of pole changers embodying the invention or inventions defined in and by claims 1, 2, 9, 12, 15, 16, 17 and 18 thereof.

"It is hereby further ordered, adjudged and decreed that the said defendants, the Illinois Electric Specialty Company, its officers, directors, stockholders, attorneys, employes, agents, servants and workmen, each and all of them, and all persons operating by, through or under the authority or direction of them, or any or either of them, be and are hereby restrained and enjoined for the remainder of the life of said re-issued letters patent No. 12,162 from further infringing the same, and from manufacturing, using or selling the said infringing pole changers or any pole changer or device containing or embodying the invention or inventions embraced in said re-issued letters patent as defined in and by the aforesaid claims 1, 2, 9, 12, 15, 16, 17 and 18 thereof, and that an injunction issue accordingly.

It is hereby further ordered, adjudged and decreed that the complainants recover from the said defendants as well as the damages sustained in or by reason of said infringement, as the profits, gain and saving made or realized by the defendants thereby, together with the costs herein, taxed and to be taxed, and that this cause be referred to Hervey W. Booth one of the masters in chancery of this court, to take, state and report an account of damages and profits under and in accordance with this decree; and that the said defendants at the hearing before said Master shall appear for examination concerning the infringing, manufacture, use and sale aforesaid, and shall produce, as they may be required, all their books, accounts, papers and memoranda relating thereto, or wherein any information concerning the same may have been kept or shall be found.

The Warner pole changer is too well known to need any comment. Over 8,000 of these instruments are in use in the telephone field and the company reports an ever increasing demand. The factories of the Warner Electric Company are at Muncie, Ind., U. S. A., and Windsor, Ont., Canada, while the general offices are at Muncie, Indiana, U. S. A.

CENTRAL ELECTRIC COMPANY'S NEW CATALOGUE.

The Central Electric Company, Chicago, ably sustains its reputation for satisfactory service in the matter of catalogues.

The new book for 1906, pretty as a picture in its heavy cover of tan and red, is now ready for delivery to all old and new prospective customers. A postal card will bring it. In this connection, it may be of interest to note that the Central's new catalogue contains over 800 pages, most profusely illustrated, and thoroughly descriptive of everything which is latest and best in the telephone and electrical fields.

The cipher code enables correspondence to be carried on completely by telegraph.

Every article has a code word, a number, the weight of the article, contents of standard packages, etc.

The number of the catalogue is 24. Especial mention is due the feature, giving approximate shipping weight, wherever possible, of items listed. This is a new feature so far as we know not embodied in any other electrical supply catalogue. It enables customers to estimate cost of ma-

terials laid down in their own cities, which is of considerable importance, particularly where freight rates are high, as in the west, and where shipments are frequently made up by purchasers with a view to securing a minimum rate. The new catalogue is, in short, a veritable mine of accurate information for every man entrusted with the buying of supplies.

VULCANIZED HARD FIBER FOR TELEPHONE WORK.

The Delaware Hard Fiber Co. are specialists in the manufacture of vulcanized hard fiber in sheets, rods, tubing and special shapes entering into the manufacture of telephones.

This company is the only concern manufacturing a complete line of fiber, which is not controlled by the fiber trust. It has a well equipped and large plant and appreciates the fact that for electrical goods fiber must be specially treated.

Hard fiber is made from specially prepared vegetable fibers by subjecting them to the action of powerful chemicals and a vulcanizing process which, together with heavy rolling and pressing, completely changes the nature of the fibers, making of them a material different in many respects from any other known substance. In structure it closely resembles horn and possesses the strength and density of a metal nearly as light as hard wood. When heated it does not melt or become soft, but chars at a very high temperature. When pure and dry, it is an excellent insulator of electricity, and for electrical work, fiber that has been cured for six months or one year gives the best results. This concern carries in stock at its factory at least 100 tons which is from six months to one year old, and especially prepared for electrical purposes.

The Delaware Hard Fiber Company's Western sales office is in charge of Messrs. A. J. Cox & Company, 1214 Chicago Stock Exchange Bldg., Chicago.

COUCH BOOKLET.

The latest Couch illustrated booklet is just bristling with new ideas and facts concerning telephones—and Couch telephones in particular. This booklet thoroughly explains the Couch automatic reset, or switchless, inter-communicating telephones. If you request it the company will be pleased to give you an estimate on your requirements, accompanied with comprehensive data. An apartment house or hotel, large factory or industrial plant, which is not equipped with a telephone system is sadly behind the times. The Couch company is specialists in such cases, and will give you prompt shipments and satisfactory results. Address the S. H. Couch Company, Inc., 156 Pearl street, Boston, Mass.

CONTINUES TO GROW.

The business of Frank B. Cook, manufacturer of protective apparatus and other telephone accessories, has continued to increase with such marked strides that additional capacity became imperative. To accommodate this demand, Mr. Cook within the past month leased the ground floor of the business block at 240 West Lake street, Chicago, his establishment having for some time occupied the second floor of same and having recently overflowed to an adjacent building at the rear. The additional space will double Mr. Cook's capacity and a lot of new machinery is now being installed, which will insure a future output more than twice as large as heretofore. Cook protectors have enjoyed a very gratifying sale throughout the telephone field and evidently are giving the best of satisfaction. Not only in the Cook apparatus of high standard but its selling force is strong and thoroughly organized, and every department of the establishment is entrusted to the hands of efficient men.

GRAND RAPIDS AUTOMATIC STATEMENT.

Mr. C. E. Tarte, general manager of the Citizens' Telephone Company, Grand Rapids, Mich., recently issued the following comparative statement of the operating and maintenance cost of the Grand Rapids exchange. The statement is interesting:

Operating Expense.
Manual Exchange.

For year ending December 31, 1903.

Exchange Labor.....$32,120.28

(This includes Local Operators, Traffic Manager, Information Clerks, Switchboard Men, and Rack Man.)

Inspection Department.$8,039.38

(This includes Wire Chief, Trouble Men, Trouble Clerks, and Supply Boy, but does not include Installers and Movers. They are kept in a different account and their time charged to Maintenance or Construction in accordance with the work done.)

Maintenance Wagon and Reconstruction Wagon..$6,648.57

(These two were combined in pay rolls at that time.)

Total $46,808.23

There were 4,839 telephones in service at the beginning of the year and 5,115 at the end of the year, an average of 4,977.

Above departments cost $9.40 per telephone per annum.

Operating Expense.
Automatic Exchange.

For year ending June 30, 1905.

Exchange Labor $3,601.42

(This includes Rural Operators, Traffic Manager, Information Clerks, Switching Operators, and part of Matron's time.)

Switchboard Men $5,981.00

(This includes Switchboard Men and Rack Man.)

Inspection Dept.....$10,720.00

(This includes Wire Chief, Trouble Clerks, Trouble Men, and Supply Man, but does not include Installers and Movers. They are kept in a different account and their time charged to Maintenance or Construction in accordance with the work done.)

Maintenance Wagon Labor $4,440.00

Reconstruction Wagon Wagon Labor $3,440.00

Total $28,182.42

There were 5,605 telephones in service June 30, 1904; and 6,633 in service June 30, 1905, an average of 6,119.

Above departments cost $4.60 per telephone per annum.

N. B.—It should be noted that the Automatic exchange operated an average of 1,142 telephones more than the manual. With the same number of telephones in operation the total cost of the manual system would have been $57,543.03 against $28,182.42 for the automatic—a difference in favor of the latter on an average of 6,119 telephones of $29,360.61.

Details of operating expense (automatic exchange), for the month of June, 1905, $2,437.

STANDARD POLE CHANGER AND DUPLEXER.

For the benefit of numerous inquirers, it may be stated here as an item of general information that the Standard pole changer, manufactured by the Current Electric Company, of 52 State street, Chicago, is not involved in any litigation—in fact, its patents are said to be not only original but very strong and comprehensive. Furthermore, the company not only guarantees absolute satisfaction to all purchasers but guarantees immunity from patent litigation of every description.

The entire mechanism of the Standard pole changer is built on the inside of a highly finished quarter-sawed oak case with the binding posts and switchboard on the outside. To observe the interior one has simply to turn it over; there is no glass to remove or get broken. It will work in all positions. Dimensions are 6x8x4 inches; weighs 3½ pounds.

It is claimed by the manufacturer to be economical and convenient, as it takes but one battery to operate it.

Its present price is but $15.00, and it will be sent on 30 days' trial to all responsible parties.

The other telephone specialty manufactured by the Current Electric Company is the Standard duplex set.

This device makes two talking and ringing circuits from one bridging metallic line and uses both simultaneously without interference.

It is very durable, as there are no movable parts to wear.

Many exchanges now have a large number in use. The price, complete, is $15.00 a set. The duplexer also will be sent on 30 days' trial, and, if it does not do the work with entire satisfaction, it can be returned at manufacturer's expense.

TRADE NOTES.

CHASE SHAWMUT COMPANY, Newburyport, Mass., has recently issued a booklet illustrating and describing "Shawmut" enclosed fuses and fittings, which may be had by application to the company.

EXCHANGE MANAGERS are requested to write the Williams Telephone and Supply Company of Cleveland, Ohio, for the new booklet recently issued entitled "Hello Central," which will be sent postpaid upon request.

THE COMMERCIAL ELECTRICAL SUPPLY COMPANY, St. Louis, Mo., is mailing an attractive post card with an illustration of its new building on the back and an illustrated description of the company's telephone apparatus.

THE CALCULAGRAPH COMPANY, 9 Maiden Lane, New York, will be pleased to send illustrated descriptive matter on the Calculagraph upon request. The attention of telephone men is called to the article in this issue on the Calculagraph written by Mr. Henry Abbott.

I. J. KUSEL, Chicago, representative of the North Electric Company, Cleveland, Ohio, is sending to the trade a postal card announcing the fact that he will call with a complete line of North samples. The card contains a photograph of Mr. Kusel with his usual business getting smile.

W. N. MATTHEWS & BRO., the Stombaugh Anchor men, of 219 N. Second street, St. Louis, have opened a New York office at 39 Cortlandt street in charge of Mr. G. E. Way. Matthews & Bro. have recently found another money-maker in the Boyless Bowling Alley, a new style of alley in which no boys are required to set up the pins or return the balls.

THE CENTRAL TELEPHONE AND ELECTRIC COMPANY, St. Louis, Mo., announce the mailing of the first of a series of twelve original photograph calendars which it will mail to the trade during 1906. The company will be glad to place on its mailing list any who are not receiving this attractive little reminder that it serves everything in the telephone line "hot and quick."

THE WESCO SUPPLY COMPANY of St. Louis, Mo., announce that it has made arrangements for the southwestern agency for one of the largest and oldest manufacturers of telephone cable, and is prepared to quote the very lowest prices on any quantity of cable to meet any desired specifications and to make immediate deliveries from a large stock which it will carry in St. Louis.

MR. J. J. NATE, Minneapolis, Minn., the northwestern agent of the Stromberg-Carlson Telephone Manufacturing Company recently made a trip to Chicago to be present at the fiftieth wedding anniversary of his parents, the Rev. and Mrs. John Nate, 1819 North Sawyer avenue. The anniversary occurred on December 6. Last summer Mrs. Nate spent a portion of the season in Minneapolis with her son.

FARR TELEPHONE AND CONSTRUCTION SUPPLY COMPANY, Chicago, has recently issued catalogue number 18 for 1906 which is profusely illustrated with nearly a hundred cuts of the complete Farr line with descriptive matter and prices. The Farr company is entering on its eleventh year in the telephone manufacturing business, and has built up a large trade, having apparatus installed in every state and territory in the Union. The company carry a stock of at least a thousand telephones at all times which enables it to ship all orders on the day they are received. Farr apparatus is fully guaranteed. The company will gladly send its new catalogue to anyone upon request.

S. H. COUCH COMPANY, INCORPORATED, Boston, Mass., in booklet No. 9 describes the automatic reset or switchless intercommunicating telephone. Sectional views and wiring diagrams are given, showing in detail the mechanical and electrical features. The company has also published several other catalogues describing telephones, switchboards and accessories, any or all of which may be secured upon request.

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, N. Y., reports some big shipments of cable to Bloomington, Ill. From all that can be learned it is evident that this company is doing a great deal of business in cable. Mention is made of the fact, in a recent booklet issued regarding this material, that the company has found it necessary to increase the capacity of its plant fourfold in two years.

THE AMERICAN ELECTRIC FUSE COMPANY of Muskegon, Mich., has recently installed for the Keystone Telephone Company of Philadelphia a complete equipment of latest type American protectors, Kaisling design; replacing the old protectors of the Keystone company. The Philadelphia exchange is the largest Independent exchange in the world and the American Electric Fuse Company is to be congratulated on securing so important an order.

THE NATIONAL-INTERSTATE TELEPHONE ASSOCIATION has prepared a miniature emblem in the shape of lapel buttons, clasp pins and hat pins. This represents the official design, and is furnished in gold plate and colors. Exchange managers are purchasing these shields for distribution among employes and subscribers. J. A. Harney, assistant secretary, Electric Building, Cleveland, Ohio, is in charge of the distribution, the prices of the shield varying with the form preferred.

THE SWEDISH-AMERICAN TELEPHONE COMPANY was an exhibitor at the International stock show held in Chicago, December 16th to 23d. Its exhibit consisted chiefly of Hercules bridging telephones. The Swedish-American company has been regular exhibitors at the annual stock show for several years. A good percentage of the many farmers visiting the stock show are interested in rural telephone lines. The company report that its business at the show this year greatly exceeded that of any previous year.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, N. Y., and Chicago, Ill., has issued a dainty booklet bearing the inscription "For Your Perusal at Leisure." This contains a number of high-class testimonials concerning the use of Stromberg-Carlson intercommunicating systems. There are illustrated portable desk telephones, central energy wall telephones, intercommunicating portable desk telephones, and a private branch exchange switchboard with a capacity of sixty lamp signal lines and ten trunk lines.

THE CONNECTICUT TELEPHONE & ELECTRIC COMPANY of Meriden, Conn., has issued new catalogues, No. 9 and No. 10, covering long distance and interior telephone equipment, respectively. These catalogues are handsomely illustrated with half-tone cuts throughout and go into careful detail with each line. Each issue contains many new and

up-to-date specialties. The Connecticut company during the last year has been obliged to largely increase its plant and the prospects are very bright for an even larger business during 1906. The company was organized in 1893 to manufacture telephones and electrical specialties, and since that time has grown each year to its present size. The company will be pleased to mail its new catalogues, No. 9 and No. 10, to anyone interested.

THE DEPARTMENT OF TELEPHONE ENGINEERING of Purdue University has at present twenty-three students enrolled. A great degree of interest is possessed by the students, as shown by the movement to establish a special telephone section of the student branch of the A. I. E. E. This movement was originated by the students to supply the need felt by them for mutual help in technical matters, exchange of experiences and unsolved questions. Additional equipment for the telephone laboratory is expected in the shape of storage battery, primary battery, battery supplies, various current measuring instruments and acoustic apparatus. The work in connection with the Rowland electro-dynamometer has begun with great interest. Already valuable results have been obtained, which are not obtainable quantitatively by any other instrument. Its value in accurate telephone work is rapidly being established.

THE STERLING ELECTRIC COMPANY of Lafayette, Ind., has not been idle even though it has given out but little news of its doings for several months. The fact is, however, the company has been very busy filling orders for switchboards, telephones, condensers and protective apparatus. Its magneto-flash-light and magneto multiple switchboards, is among its best sellers with small exchange owners. The following list of recently filled orders includes large as well as small boards:

Joplin, Mo.; Los Angeles, Cal.; Buck Creek, Ind.; Toledo, Ohio; Huntington Beach, Cal.; Taylorville, Ill.; New York, N. Y.; Mayfield, Ky.; Galesburg, Ill.; Whittier, Cal.; Versailles, Ky.; Douglas, Kan.; Mars, Pa.; Winona, Minn.; Bloomington, Ind.; Clay, Ky.; Marion, Ky.; Providence, Ky.; Hawthorne, Pa.; New Philadelphia, Ohio; Tionesta, Pa.; Clarion, Pa.; Revere, Mo.; Viola, Ky.; Fancy Farm, Ky.; Manhattan, Kan.; Bolivar, Mo.; Uhrichsville, Ohio.

ONCE A CUSTOMER ALWAYS A FRIEND, the motto of the Sterling Electric Company, seems to be well borne out by the large number of repeat orders they daily receive from old customers. The following partial list of orders for additional switchboard equipment, not only indicates well-satisfied customers, but a prosperous condition of affairs in the Independent field generally: Hudson, N. Y.; Seymour, Ind.; Beverly, Kan.; Saginaw, Mich.; Elizaville, Ind.; Wolcott, Colo.; La Grange, Mo.; Shelbyville, Ind.; Huntsville, Texas; Brookville, Pa.; Mt. Vernon, Ind.; Mulvane, Kan.; Max, Ind.; Elkhart, Ind.; Charleston, Ill.; Bloomington, Ind.; Smithland, Ky.; Fedora, S. D.; Champaign, Ill.; Kentland, Ind.; Hallsville, Mo.; Boswell, Ind.; Terre Haute, Ind.; Robinson, Ill.; Earlville, Ill.; Defiance, Ohio; Sioux Falls, S. D.; Pittston, Pa.; Wilkes Barre, Pa.; South Raub, Ind.; Cheboygan, Mich.; Abilene, Texas; Clarksville, Tenn.; Yankton, S. D.; Rantoul, Ill.; Henry, Tenn.; Hamilton, Mo.

THE INDIANA STEEL AND WIRE COMPANY, Muncie, Indiana, request inquiries for telephone wire quotations. The company is running its mill twenty-four hours a day to keep up with its orders. The following letter from the Delaware and Madison Counties Telephone Company will give an idea of the way the company's product is received:

"In reply to yours of the 17th will say that upon looking up our record I find we have used in the past four years about eight carloads of your B. B. iron telephone wire and with very satisfactory results. All our farm lines and all of our exchanges in the smaller towns have been constructed with your wire. In the larger places we used No. 14 copper exclusively. We are well pleased with the service given us and found the wire to be uniformly well galvanized and to have the maximum amount of conductivity with a minimum resistance. You are at liberty to refer any inquiries to us, as we shall have no hesitancy in recommending your goods to our fellow Independent operators."

CHAS. A. ROLFE recently won in the Court of Appeals a decision against Otto C. Hoffman involving the first patent ever issued covering the self-soldering heat coil. This gives to Mr. Rolfe in addition to the other patents which he has applied for and which have been issued to him this old Hoffman patent. Mr. Rolfe has for many years been prominent as an inventor of telephone protector apparatus and has devised a great many very ingenious and highly valuable protectors.

The American Electric Fuse Company is the sole licensee on all patents of Chas. A. Rolfe and is manufacturing also under patents of Wm. Kaisling and others. The company is said to control upwards of 200 patents on telephone protector apparatus including the well-known self-solderig patents. The company is now established at its new factory, having moved its offices from Chicago. TELEPHONY in an early number will print a description of the new American plant. This plant is one of the largest and best equipped plants in the Independent telephone field. This company is now employing over 400 workmen. The increase of business of the company has been phenomenal. At the present time it has in excess of half a million dollars a year in sales which testifies of the merits of American protectors.

THE SWEDISH-AMERICAN TELEPHONE COMPANY, whose reputation for spirit, enterprise and progressiveness is well established, will be one of the leading telephone exhibitors at the first annual electrical show, to be held at the Coliseum in Chicago, January 15th to 27th, 1906. This show will be of far-reaching interest to all Independent telephone men, as all that is new and up-to-date in telephony will be exhibited. The Swedish-American company will be well represented and prepared to extend any courtesy to visiting Independents. Its exhibit will consist of the well-known types of Swedish telephones, central office equipment, telephone and switchboard parts. Nothing has been left undone to make this show a grand success. Each and every exhibitor is striving to outdo his neighbor, and a friendly rivalry exists as to who will have the most interesting and original exhibit. The Swedish-American company cordially invite all visiting Independents to see its exhibit, and from present indications the visiting list will be large. Many telephone men have signified their intention of visiting the show for the purpose of buyng their next year's supply of telephones, and the above named company will be prepared to show, and furnish estimates on whatever may be required. Don't forget the date, January 15th to 27th, 1906.

A MISSOURI STORY.

Among the "local Edisons" in the telephone field is one, Mr. Ashley McKinley of Marissa, Ill., who devotes the greater portion of his time to hustling for Wesco telephones down in the land of Egypt. Among the many amusing stories of his experiences, he relates an incident of his recently installing a farmers' telephone line. Having connected the first two instruments on the line, he rang up from the second instrument to the first to see if they would work properly. A voice answered the call and McKinley said, "Hello! who

is this" "Jakie Spieler," came the reply. "All right, Jakie, let me have three long rings," said McKinley, wishing to know if the second station would respond properly to a signal. All was silent for some moments and McKinley began to think there was trouble in the ringer, so he rang back again to the first station and soon received a reply. "Hello! who is that?" said McKinley. "Jakie Spieler," again was the reply. "Well, Jakie, why don't you send me those three long rings?" "What!" said Jakie, "did you leave those three rings here? I have been out in the yard looking for them."

AN INVITATION.

THE CHICAGO TELEPHONE SUPPLY COMPANY, Elkhart, Indiana, is sending to telephone men the following invitation:

Another feast of reason which is bounteous in its proportions has been prepared for the Faithful, and no worthy applicant will be denied. The admission will be by postal card and no other payment, fee or remittance will be required.

On the postal card please indicate with which course you desire to begin and it will be served immediately with all the pomp, ceremony and trimmings that have hitherto characterized the functions held under the auspices of our great chief Satisfy.

Other courses will follow in regular succession or, if you prefer a potpourri, all courses will be served at once in magnificent profusion.

In such an event you will also receive a mental laxative to prevent intellectual indigestion.

The chef has prepared a menu which is presented below for your inspection.

Finally: Are you with us? If so, send a postal card bearing your name and the names of the town and state which you honor with your presence.

No other wording is necessary except the words, "Your invitation is accepted."

We have spoken.

Appended to the above is the company's menu of catalogues comprising magneto telephones, express switchboards, visual signal and toll boards, common battery apparatus, automatic equipment and the company's general catalogue. Telephone men may have any one or all of the above catalogues by making a request for same.

BETTER CROSS ARMS AND MORE OF THEM.

The Frost Cross Arm & Lumber Manufacturing Co. of Cleveland, O., has purchased over 12,000 acres of land, and timber of long leaf yellow pine, near Ocala, Florida, on the Atlantic Coast Line Railroad, and has in process of erecting a new and modern mill which will have over five times the capacity of the company's present plant at Chesterfield, South Carolina. This plant will be divided into three departments, namely, for rough lumber; for dressed and kiln-dried lumber, such as dimension stock, car sills, etc.; and for cross arms. The company's specialty will be long-leaf, all-heart, yellow pine cross arms of the highest grade only, and expect to be in a position to accept orders soon after the first of the year, when its present plants will have been disposed of and it will have one southern office in Florida. The general offices will be moved from Cleveland, O., to some point near Philadelphia, Pa., yet to be decided upon. The company will, in all probability, change its name to the Lake Yale Lumber Company, as the new timber supply in question is on that lake. The management of the company will be the same as before.

ANNOUNCEMENT.

We beg to announce that we have decided to discontinue our New York offices and that same have been closed December first. We have been led to take this step, believing it to be in the interests of our patrons to deal direct with the head office; in fact, the nature of our business, involving, as it does, such a variety of engineering problems, makes direct dealing desirable, if not essential. We feel confident that this change will enable us to handle the business more expeditiously than in the past and trust it will meet with general approval.

Kindly address all communications in future to The Holtzer-Cabot Electric Co., Brookline, Mass.

Assuring the trade of our appreciation of past favors and hoping to merit a continuance of patronage.

THE HOLTZER-CABOT ELECTRIC COMPANY.

THE LA SALLE DRY BATTERIES.

The La Salle dry battery keeps on making more and more friends amongst the telephone fraternity every year.

A great many of the leading companies now employ this popular battery almost exclusively. It is claimed by the manufacturers to be carefully made from the best of materials and constantly maintained at the highest possible standard. The La Salle batteries are not "cheap" batteries in the ordinary acceptance of the term, but in the long run it is claimed they will be found to be the most economical and most satisfactory.

The La Salle Electric Co., 47 W Lake street, Chicago. manufactures the La Salle dry battery and is very conservative in all of its claims and advertising matter. However, it is very gratifying to note, in this age of wild commercialism and exaggerated inducements, that the La Salle Co. claims to be fully prepared to back up any statements it may make. It invites trial orders to prove the quality of its goods. This battery is the product of twenty-seven years of ripe experience and is made under the careful personal supervision of Mr. M. M. Clark, who has been in the battery business for that period of time.

AN INJUNCTION ISSUED.

An injunction has been issued against the Columbia Dry Battery and Vim Company, both of Chicago.

These companies recently began making and selling a cheap dry battery, using the trade mark "Columbia," which is the property of the National Carbon Company, to assist the sale.

Suit was brought before Judge Kohlsaat in Chicago, with the result that on December 12th an injunction was issued against them, forbidding them from offering for sale any dry batteries not made by the National Carbon Company, to which is applied the word "Columbia," or the words "Columbia Dry Battery Company." The effect of this injunction is to confirm the National Carbon Company in the possession of the trade mark "Columbia."

BLACKBURN GROUND CLAMP.

Geo. R. Blackburn, Cleveland, Ohio, is mailing descriptive folder and samples of the Blackburn ground clamp. The superintendent of one of the largest Bell telephone companies in the United States writes: "We have made an extensive study of ground clamps, and wish to say that the sample you have submitted is superior to any other clamp." Telephone companies having ground connections to make will be benefited by requesting a sample.

BURGLARY ON PARTY LINE.

A year ago this month a young couple residing in Chicago visited friends in another part of town and accepted an invitation to remain over night. To allay any uneasiness regarding the condition of their house they called up a friend in their immediate neighborhood, telling her that they would not be at home during the night and asking her to please see if the house had been properly locked.

The telephone over which this message was received was on a ten-party line and during the conversation the removal of a receiver by someone on the line was distinctly heard.

The fact that others were "listening in" made no particular impression, as it was so common an occurrence. The next morning on returning home the young couple found their house ransacked, everything of value of a portable nature gone and a woman's foot-prints made in some talcum powder that had been overturned upon the floor. On the dining room table was found a bowl of testing acid, showing that the robbers had been aware of their safety from interruption and taken their time to test the silverware and jewelry before selecting their spoil. Police investigation developed the fact that a great many robberies had been planned and executed in the city from information obtained by "listening in" on party lines.

The advertising department of the Baird Manufacturing Company is authority for this information and able to give dates, names of parties, address and number of the telephone used. The Baird people also tell us that had this line been equipped with their Secret Service system this could not have occurred, as it would have been impossible for anyone to listen in on the line and obtain the information thus used.

KEYSTONE TELEPHONE.

In a recent bond circular, Fisk & Robinson have the following to say in regard to the Keystone Telephone Co. of Philadelphia:

"In response to the demand for additional telephone service, work of extension has been rapidly pushed. Additional conduits have been laid in the northwestern part of the city and in the Manayunk district, and extensions will be made to Chestnut Hill. A large force of men is already at work in West Philadelphia and the switchboard of that exchange has been extended. The West Philadelphia section has been built up so rapidly that the conduit system will have to be extended from the present termini, which is about 50th street, west on all the principal thoroughfares to City Line. Nearly $200,000 worth of additional cable has been ordered and about two-thirds of it has been installed in the conduits and will be put in service at an early day.

"The Keystone State Telephone & Telegraph Company is also doing a great deal of extension work in the surrounding counties. A line has been completed to Newtown, Bucks County, and a new exchange installed at that place. Three additional exchanges at suburban points will shortly be established."

TELEPHONE COMPANIES IN QUEBEC.

There are located in the Province of Quebec a larger number of telephone companies than in any other province of the Dominion. A list recently compiled for the house of commons telephone committee showed that—exclusive of the Bell Telephone Co., which though having its head offices in Montreal, carries on business under its general charter in other parts of Canada—there were 28 separate and distinct telephone companies carrying on business in Quebec. A list of these is appended:

Jos. Archambault, L'Epiphanie; Beauce County Telephone Co., St. de Beauce; Beauce Telephone Co., St. Francois; Bellechasse Telephone Co., Levis; Canadian Telephone Co., Sawyerville; P. Deshaise, Doucet's Landing; Eastern Townships Telephone Co., Sherbrooke; Electric Light and Telephone Co., Solomon A. St. Pierre; Fournier Villemarie, St. Valere de Bulstrode, Drummond, Arthabaska; F. Gauthier & Co., Drummondville; Joliette Telephone Co., Jolliette; Kamarouska Telephone Co., Fraserville; Laurentides Telephone Co., Laurentides; H. Lemieux & Sons, Murray Bay; L'Epiphanie Local Telephone Co., L'Epiphanie; Megantic Telephone Co., St. Julie de Somerset; Merchants' Telephone Co., Montreal; Metis Telephone Co., Little Metis; People's Telephone Co., Sherbrooke; T. B. Rider, Fitch Bay; Roberval Telephone Co., Roberval; St. Laurent Telephone Co., St. Francis du Lac; St. Lawrence Telephone Co., St. Francis du Lac; St. Maurice Telephone Co., Shawenegan; St. Maurice Telephone Co., Three Rivers; St. Winceslas Parish Telephone Co., St. Winceslas; St. Zepherin Telephone Co., St. Zepherin.

MEETING OF WEST VIRGINIA INDEPENDENTS.

At a recent meeting of the executive committee of the Independent Telephone Association of West Virginia, held in the office of W. C. Handlan, manager of the National Telephone Company in Wheeling, it was decided to hold the first meeting of the association at the Chancellor Hotel of Parkersburg, on February 22 and 23, 1906, at which time the representatives of all the Independent telephone companies of the state and also from other states will be in attendance.

The object of the coming meeting is to bring all of these who do not now belong to the association into it and bring harmony among the Independents so that all may fight in harmony in the battle against the competing company.

The executive committee members at the meeting were General Manager A. E. Davis, of the West Virginia Telephone Company of Parkersburg; J. Walter Barnes, general manager of the Consolidated Telephone Company of Fairmont, and W. C. Handlan, of the National Telephone Company of Wheeling.

THE TELEPHONE POLE.

Nothing will cause one to realize more clearly the great extension of the use of the telephone than a drive or a walk through the country. Everywhere one goes he finds the roal bordered with a line of telephone poles, says the *Electrical Review*. In the towns these lines are more substantial, and carry more wires, but in localities further removed from settlements, he still will find a line carrying possibly not more than one or two wires, looping in at a house here or store there, thus connecting together and to some neighboring village a fair proportion of the houses of the district. While the city service is, of course, much greater, both in its equipment and in the use to which it is put, the rural service may be compared with it in its importance to those who employ it. It gives a sense of security not only to the subscriber, but to the neighbors, who know that in case of necessity there is means at hand for quickly obtaining assistance. These rural systems meet a long-felt need. There is nothing that can take their place. They give a means of communicating quickly; they save much time and trouble in running errands and delivering messages; but, more than all, they remove that feeling of isolation which is so often a drawback of the country house, without in any way reducing the owner's privacy. It brings one's neighbors within call, without bringing them into sight, and this is obtained at a moderate expense, a consideration not to be overlooked. The rural telephone system, judging from its advantages, seems likely to grow into enormous proportions before many years are passed.

TELEPHONE OLD INVENTION.

News has just been received here that an English officer in Hindoostan has discovered that many ancient Indian temples in out-of-the-way places were connected with each other by metallic wires and a kind of telephone. Through archæological investigations the same officer has discovered that practical telephone communication somewhat like that of the present day was known to the inhabitants of India more than two thousand years ago.

PROGRESS OF THE MONTH

Compiled by H. A. Downey

NEW COMPANIES

NOWATA, I. T.—The Delaware Telephone Company has been incorporated.

ILLMO, Mo.—The Illmo-Edna Telephone Company has been incorporated.

REINBECK, Ia.—The United Exchange Company has been incorporated at this place.

ST. JOHN, Kans.—The Seward and St. John Telephone Company has been incorporated.

ELGIN, Ia.—The Turkey River Telephone Company has been organized at this place.

GULNARE, Ky.—A telephone company has been incorporated at Gulnare; also at Sergent.

HAWESVILLE, Ky.—The Chambers Telephone Company has been incorporated at this place.

CASCADE, Mont.—The Cascade Telephone Company has been incorporated at this place.

RAY, Kans.—The Homestead Telephone Company has been incorporated at this place.

CRAWFORD, Neb.—The Crawford Independent Telephone Company has been incorporated here.

DOVESVILLE, Va.—The Dovesville Mutual Telephone Company has been incorporated at this place.

AMERICUS, Kans.—The Farmers' Mutual Telephone Association has been incorporated at this place.

PROLE, Ia.—The Farmers' Mutual Telephone Company has filed articles of incorporation at this place.

EDINBURG, Pa.—The Rural Telephone Company has been incorporated with a capital stock of $5,000.

OLIVE HILL, Ky.—The Big Sandy Telephone & Telegraph Company has been organized at this place.

BATH, Ky.—The Bath Home Telephone Company has been incorporated with a capital stock of $15,000.

AUSTINTOWN, O.—The Austintown Telephone Company has been incorporated with a capital stock of $5,000.

INWOOD, W. Va.—The Inwood Rural Telephone Company has been organized to construct a telephone system.

TOPEKA, Kans.—The Douglas Home Telephone Company has been incorporated with a capital stock of $5,000.

MADISON, N. H.—The Madison Local Telephone Company has been incorporated with a capital stock of $1,000.

MACKSBURG, Ia.—The Madison County Telephone Company has been incorporated by W. N. Smoot and associates.

CORNETTSVILLE, Ky.—A telephone company has been incorporated at this place with a capital stock of $15,000.

DANA, Ind.—The Indiana Telegraph and Telephone Company has been incorporated with a capital stock of $50,000.

KNOX, Ia.—The Knox Telephone Company has been organized with C. F. Morse as president and A. D. Benson secretary.

CHARLESTON, W. Va.—E. A. Barnes, F. M. Staunton and others have organized the Charleston Home Telephone Company.

BEAVER SPRINGS, PA.—The Farmers' & Merchants' Telephone Company has been incorporated with a capital stock of $6,000.

TOPEKA, Kans.—The state charter board has granted a charter to the Alton Mutual Telephone Company. Capital stock of the company is $4,000.

FARIBAULT, Minn.—The Webster Farmers' Co-operative Telephone Company has been incorporated at this place with a capital stock of $50,000.

CARTHAGE, N. C.—The Carthage Telephone Company has been chartered, with a capital stock of $5,000, W. C. Petty being the principal incorporator.

ST. MATTHEWS, S. C.—The St. Matthews Telephone Company has been incorporated with a capital stock of $2,500 by T. H. Dreher and G. A. Baxter.

MARSHALL, Mich.—The North Marshall Telephone Company has been organized with a capital stock of $1,000. The main office of the company will be Ceresco.

GILEAD, Neb.—The Gilead Home Telephone Company has been incorporated with a capital stock of $6,000. I. W. Deavers and others are the incorporators

DAVENPORT, O. T.—The Ridley Telephone Company has been incorporated with a capital stock of $5,000. The incorporators are R. C., W. R. and G. A. Ridley.

RIDGWAY, PA.—The Commercial Union Telephone Company has been chartered with a capital stock of $5,000. S. G. Latta of Wilcox is treasurer of the company.

ALBUQUERQUE, N. M.—The Nash Electrical Supply Company has been incorporated with a capital stock of $15,000. The incorporators are M. Nash and others.

MONTROSE, Miss.—The Jasper Telephone Company has been incorporated with a capital stock of $1,500. The incorporators are L. L. Denson, P. L. Blackwell and others.

BOYERTOWN, Pa.—The Mountain Telephone Company has been organized by farmers and merchants to operate in southern Berks county. Construction work will begin at once.

ST. ANTHONY, Idaho.—An Independent telephone company has been organized with headquarters at this place. It is the purpose of the company to build telephone lines in this vicinity.

HARRISON, Ia.—The Excelsior Telephone Company has been organized by the following: Morgan Jones, Harvey Buckler, T. J. Henley, James McKinley, J. N. Buckler, and others.

MAYFIELD, Ky.—The Fancy Farm Telephone Company has been organized as a stock company with a capital stock of $1,000. Among those interested are B. B. Burch, E. F. Cash, S. T. Cross.

QUINCY, Ill.—The Quincy Long Distance Telephone Company has been incorporated with a capital stock of $2,000. The incorporators are Frank J. Penick, J. R. Pearce, Samuel F. Scott.

GUTHRIE, Okla.—The Independent Telephone Company has been incorporated with a capital stock of $25,000. The incorporators of the company are J. W. Kerns, F. C. Hoyt and H. A. Seaton.

WILMORE, Kan.—The Home Telephone Company has been incorporated with a capital stock of $3,000. The officers of the company are: President, J. M. McCay; secretary, P. H. Williams.

MOUNT CARROLL, Ill.—The Mount Carroll Mutual Telephone Company has been incorporated with a capital stock of $5,000. The incorporators are Otho Watson, W. K. Stakemiller, Dan S. Mackey.

FRAZEYSBURG, O.—The Frazeysburg Telephone Company has been incorporated, with a capital stock of $10,000, by the following: S. H. Frazier, A. J. Stitt, W. S. Drake, Nathan Nethers, M. Frazier.

CANBY, Ore.—The Farmers' Home Telephone Company has been incorporated with a capital stock of $10,000. The incorporators of the company are G. W. Scramlin, O. O. Miller and A. J. Strubhar.

ARCADE, N. Y.—The Home Telephone Company has been incorporated with a capital stock of $10,000. The incorporators are Thaddeus S. Lane, John H. Wright, Frank H. Knott, of Jamestown.

ALPHA, Ia.—The Alpha Telephone Company has been organized with the following officers: President, Charles Carr; secretary, F. B. Dodd; vice-president, A. Shurtlupt; treasurer, A. A. Finch.

LACONA, Ia.—The Lacona Telephone Exchange has filed articles of incorporation with the secretary of state. The capital stock of the company is $4,000, and Samuel Oxenrider is principal stockholder.

DEERFIELD, Wis.—The Deerfield Telephone Company has been incorporated, with a capital stock of $10,000. The incorporators of the company are as follows: H. C. Winter, W. Jackson Bell, Mary J. Bell.

PITTSBURG, Ill.—The Vandalia and Southwestern Telephone Company has been incorporated, with a capital stock of $5,000. The incorporators of the company are: A. Tedrick, T. J. Inman, W. T. Rodeker.

NIOBE, N. Y.—The Niobe Telephone Company has been incorporated with a capital stock of $1,000. The incorporators are as follows: L. L. Warner, L. C. Way, C. L. Rexford, all of Niobe, and others.

MONTGOMERY, Tex.—The Montgomery Telephone Company has been incorporated with a capital stock of $1,000. The incorporators of the company are F. W. Peynghaus, M. S. Peynghaus, and Robert J. Sullivan.

HURDLE MILLS, N. C.—The North Carolina Telephone Company has been incorporated, with an authorized capital stock of $100,000. The incorporators of the company are: D. S. Miller, J. I. Coleman and others.

VANDALIA, Ill.—The Vandalia and Southwestern Telephone Company has been incorporated with a capital stock of $15,000. The incorporators are as follows: A. J. Tedrick, T. J. Inman, N. T. Rodeker.

CHARDON, O.—The Geauga County Telephone Company has been incorporated with a capital stock of $10,000. The incorporators are as follows: R. C. Carver, W. R. Nutt, H. T. Brown, James Nevan, J. T. Daniels.

FORRESTON, Ill.—The Forreston Mutual Telephone Company has been incorporated with a capital stock of $5,000. The incorporators of the company are as follows: Henry Zumball, Henry Rabmeyer, Joseph Doltman.

CENTRAL POINT, Ore.—An Independent telephone company has been organized at this place with the following officers: President, Geo. Randall, Sr.; vice-president, J. M. Olds; secretary and treasurer, Geo. Randall, Jr.

PLEASANT HILL, Ore.—The Edenvale Telephone Company was recently organized with the following officers: President, R. J Hemphill; vice-president, E. P. Lattin; secretary, D. G. Linton;

treasurer, W. H. Shelley; directors, J. W. West, Walter Remvick, J. M. Cornelius.

NEW MILFORD, ILL.—The New Milford Telephone Company has been incorporated with a capital stock of $5,000. The incorporators of the company are as follows: T. W. Evans, F. C. Bell, A. T. Chase.

DELMAR, DEL.—The Riverton & Delmar Telephone Company has filed articles of incorporation to construct and operate telephone and telegraph lines in the state. The capital stock of the company is $50,000.

BRENHAM, TEX.—The Brenham-Washington Telephone Company has been incorporated with a capital stock of $1,500. The incorporators are: W. C. Bohne, W. H. Buck, W. H. Buck, A. C. Krueger and others.

COLUMBUS, O.—The Washington and Monroe Telephone Company has been incorporated with a capital stock of $5,000. The incorporators are E. D. Amos, William Kelte, C. McHugh, W. Q. Moore, C. A. Amos.

PERRYVILLE, Tenn.—The W. C. Cole Telephone Company has been incorporated with a capital stock of $5,000. The incorporators of the company are W. C. Cole, J. U. Speer, I. A. Raines, L. H. Burke and Frank Kent.

TOLEDO, O.—The Western Ohio Telephone & Telegraph Company has been incorporated with a capital stock of $100,000. The incorporators are John G. Meilink, A. C. Stevenson, F. E. Palmer, J. W. Davis, Joshua Lindahl.

GLENWOOD, W. Va.—An Independent telephone company has been organized at this place with the following officers: President, W. H. Carson; vice-president, F. A. MacDonald; treasurer, P. S. Fisher; secretary, G. C. Smith.

BURLINGAME, Kans.—A new telephone company has been organized in the vicinity of Burlingame. It is the purpose of the company to extend a line into Burlingame and connect with the Farmers' Mutual Telephone Company.

WATERLOO, Ia.—Farmers have organized the Finney Rural Telephone Company. The company will build a telephone line through Saline county to Belleville and another which will connect with the Waterloo Farmers' Telephone line.

DREWRYVILLE, Va.—The Courtland-Emporia Telephone Company has been incorporated at this place. The capital stock is $5,000. The incorporators are as follows: D. B. Drewry, president; F. P. Pope, secretary; both of Drewryville.

ANADARKO, Okla.—A charter has been issued to the Anadarko and Apache Telephone Company, with a capital stock of $30,000. The incorporators of the company are H. A. Dyer, O. W. Doyers and W. J. Skidmore, all of Anadarko.

MOUNT ZION, Mo.—The Mount Zion Mutual Telephone Company has been incorporated with a capital stock of $4,800. The incorporators are J. D. Snyder, J. W. Stanton, T. H. Good, J. N. Butler, E. P. Edwards, T J. Bilderlack and others.

BEAVER SPRINGS, Pa.—The Farmers' & Merchants' Telephone Company has been chartered with a capital stock of $6,000. J. M. Baker, Beaver Springs, is treasurer of the company. The company will have an exchange at Beaver Springs.

GLENWOOD, Minn.—The Glenwood Telephone Company has been incorporated with a capital stock of $12,000. The incorporators of the company are as follows: M. A. Wollan, C. T. Wollan, C. O. Wollan, Peter Peterson, H. D. Peterson.

GERONIMO, Ariz.—The Farmers' Co-operative Telephone Company has been incorporated, with a capital stock of $25,000. The directors of the company are: J. L. Porter, W. S. Bettman, L. L. Young, W. S. Williams and Alex Scruggs.

SPRINGFIELD, Tenn.—The Springfield Home Telephone Company has been incorporated with a capital stock of $7,000. The incorporators are A. L. Dorsey, J. McMurray, B. C. Moore, G. Moore Thomas Pitt, H. T. Stratton, Jr., H. C. True.

HANOVER, N. H.—The Hanover Telephone Company has been organized with the following officers: President, H. T. Howe; vice-president, S. W. Smith; secretary, L. H. Jones; treasurer, A. W. Guyer; superintendent, H. B. Fullington.

FAYETTE, Ala.—Notice of the incroporation of the Fayette Telephone Company has been filed with the secretary of state. The capital stock of the company is $2,000 and the incorporators are W. J. Johnson, V. J. Johnson, and F. T. Johnson.

BILLINGS, Okla.—The Billings and Red Rock Telephone Company has been incorporated at this place with a capital stock of $30,000. The board of directors is composed of the following: Roy Henry, Rozella Henry, Nannie J. Carter.

PLEASANT HILL, Ala.—The Pleasant Hill and Selma Telephone Company has been incorporated with a capital stock of $2,000. The incorporators of the company are T. E. Knight, N. B. Rudulf, T. B. Fetts, W. S. Harrell, J. P. Stringer and others.

DOVER, Tenn.—The Farmers' and Merchants' Telephone Company of Stewart County has been incorporated with a capital stock of $500. The incorporators of the company are H. A. Causey, F. P. Edwards, Joe Gay, S. B. Mayes and Joe Melton.

HOPETON, Okla.—The Hopeton Telephone Company has been incorporated with a capital stock of $10,000. The officers of the company are as follows: President, H. H. Davis, Hopeton; secretary and treasurer, N. A. Andrews, Dacoma, Okla.

GUTHRIE, Tex.—The Cottonwood Valley Telephone Company has been incorporated with a capital stock of $325. The incorporators of the company are Will H. Campbell, A. Ellison, G. W. Omart, G. W. Gaffney, W. H. Boyd, S. H. Oleson.

CENTER LOVELL, Me.—The Lovell Telephone and Telegraph Company has been incorporated with a capital stock of $5,000. The officers of the company are as follows: President, C. P. Hubbard of Lovell; treasurer, J. Q. Mason of North Lovell.

STILLWATER, O.—The Stillwater Mutual Telephone Company has been incorporated at this place with a capital stock of $50,000. The incorporators are as follows: A. W. Collins, O. H. Groves, M. O. White, T. J. Murphy, Fred A. Groves and I. H. Smith.

PENASCO, N. M.—The Penasco Telephone Company has been incorporated with a capital stock of $10,000. The incorporators of the company are Harry N. Hamilton, David W. Runyon, Floy R. Hamilton, Morgan N. Davis, John C. Gage, all of Artesia.

MAYFIELD, Ky.—The Jimtown Telephone Company of Jimtown, Ky., has been incorporated with a capital stock of $800. The incorporators of the company are as follows: W. T. Glover, J. A. Hule, J. M. Perkins, J. N. Sanderson, J. F. Wyatt, J. M. Gossett.

MOUNTAIN VIEW, Ark.—A telephone company has been formed in Mountain View for the purpose of installing a local telephone system. The officers of the company are as follows: President, J. L. Lancaster; secretary, Cebern Brooks; treasurer, S. S. Brewer.

EL RENO, Okla.—The Canadian County Mutual Telephone Company has been incorporated with a capital stock of $10,000. The incorporators of the company are as follows: John D. McLean, William J. Newland of El Reno, James Chappell of Union City.

SOUTH BERWICK, Me.—The Pacific Telegraphone Company has been incorporated with a capital stock of $1,000,000. The officers of the company are as follows: President, R. S. Earle; treasurer, E. S. Cox, both of Boston; clerk, F. A. Hobbs, South Berwick, Me.

HAMMONDSPORT, N. Y.—The Pleasant Valley Telephone Company has been incorporated with a capital stock of $5,000. The officers of the company are as follows: President, J. W. Brundage; vice-president, William Dildine; secretary, Pierre Brundage; treasurer, James H. Smellie.

OLYMPIA, Wash.—Articles of incorporation have been filed with the secretary of state by the Citizens' Telephone Company with a capital stock of $100,000. The incorporators of the company are Van R. Pierson, E. R. Webster, A. G. Corbett, Eugene A. Marsh, and Ralph S. Nichols.

MEDICAL LAKE, Wash.—The Medical Lake Telephone Company has been incorporated with a capital stock of $10,000. The incorporators are as follows: C. V. Ellis, president; C. H. Merrill, vice-president; Stanley Hallett, secretary; Ben Nail, treasurer, and J. P. Goldback, manager.

DOVER, Del.—The Central Home Telephone Company has been incorporated in this city with a capital stock of $5,000,000. The incorporators are Edwin L. Barber, Wauseon, O.; Joshua B. Powers, Louisville; John C. Monteith, Bloomington, Ind.; James E. Bergen, Nanticoke, Pa.

WINCHESTER, Ind.—The stockholders of the Winchester Telephone Company have voted to absorb the Parker City plant, with toll lines to Albany and Losantville, and a new company has been organized to be known as the Indiana Telephone Company, with a capital stock of $150,000.

RUSSELL, N. D.—The Russell Telephone Company has been incorporated with a capital stock of $5,000. The incorporators are as follows: A. J. Bucholz, M. A. Corey, Deep River, N. D.; John F. McKnight, A. D. Medhurst, J. K. Laporte, Russell, N. D.; E. V. McKnight, Sheldon, N. D.

MILLER, S. D.—Articles of incorporation have been filed for the Hand County Telephone Company, with a capital stock of $10,000, with privilege of increasing it to $20,000 by a vote of the stockholders. The incorporators of the company are E. F. Waite, W. J. Holbaum, G. E. Richardson.

FT. WAYNE, Ind.—The *News* is authority for the statement that the American Signal Company has been formed with a capital stock of $10,000,000, to develop the idea of sending messages by telephone from moving trains. It is also stated that the invention has been made and patents applied for.

SMARTVILLE, Neb.—An Independent Telephone Company, to be known as the Johnson County Telephone Company, has been organized at this place, with the following officers: President, Rev. Charles Swiklinski; vice-president, David Bowen; secretary, Homer Moore; treasurer, Henry Hintz.

INDIANAPOLIS, Ind.—The St. Joseph Valley Telephone Company has been incorporated for the purpose of establishing and maintaining telephone exchanges in La Porte, St. Joseph and seven other counties. Among the incorporators are Theodore Donovan of South Bend and L. B. Crow of Elkhart.

BROOTEN, Minn.—The Brooton Telephone Company, which was organized a short time ago, has been incorporated with a capital stock of $10,000. The officers of the company are as follows: President, T. O. Shelso; vice-president, A. A. Mahlum; secretary,

M. F. Reine; directors, W. F. Williams, Albert Nelson and W. Stewart Leech.

CARSON CITY, Nev.—The Silver Bow Telephone & Telegraph Company has filed articles of incorporation with the secretary of state. The company is capitalized at $50,000 and will operate from Tonopah. The incorporators are as follows: W. L. McGonigill, Raymond D. Frisbie, W. J. Wheaton.

TECUMSEH, Neb.—Articles of incorporation have been filed with the secretary of state for the Johnson County Home Telephone Company, with a capital stock of $50,000. The incorporators of the company are J. H. Luneman, W. D. Waganer, M. Bolton, O. Wettstein, F. E. Cobb, J. Barsby, E. K. Cobb, G. W. Pearson.

BLACKSVILLE, W. Va.—The Green County Telephone Company has been chartered to construct and operate telephone lines in Marion and Monongahela counties. Capital stock, $100,000. Incorporators, Edward McSweeney, Pittsburg; Thomas B. Lee, Crafton; Edward Barrett and Edward T. Galway of Waynesburg, Pa.

NEW WILMINGTON, Pa.—The New Wilmington Telephone Company has been organized by J. M. Houston, William A. Thompson and others. The company is completing the installation of a local telephone system at New Wilmington. A contract has been signed to connect with the Union Telephone Company's long distance lines

SPRINGFIELD, Ill.—The Soperville and Log City Telephone Company has been licensed to incorporate by the secretary of state. The capital stock of the company is $625. The incorporators are as follows: Jacob Brown, president; C. J. Maxwell, secretary; James Pendergast, treasurer; George Essex, George Blue and James Fields.

MILFORD, N. J.—The Delaware Valley Telephone Company has been incorporated with a capital stock of $5,000. The incorporators of the company are as follows: Alton C. Ropp, Mahlon W. Angell, William H. Farrand, Elmer E. Culver, Edward P. Hager, John Ulmer, Walter Bingstresser. Elmer E. Culver is the agent in charge.

PORTLAND, Me.—The Union Traction Company has been organized in this city for the purpose of constructing, owning, operating and maintaining railway, telephone and telegraph lines, with a capital stock of $100,000, of which $500 is paid in. The officers of the company are as follows: President, Geo. F. Duncan of Portland; treasurer, Edward Woodman.

SPRING VALLEY, Ill.—The Spring Valley Telephone Company has been organized by business men of this city with a capital stock of $10,000. The company expects to spend this amount the first year in putting the system upon a running basis. An exchange will be opened here about January 1 and later exchanges will be established at Ladd, De Pue and other towns as soon as forty or fifty subscribers are secured in each town.

BLACK SPRINGS, Ark.—The Black Springs Telephone Company has filed articles of incorporation with a capital stock of $5,000, of which $1,000 is subscribed. The incorporators are W. C. Rowton, J. M. Rowton, W. C. Warren, C. C. Welsh, W. W. Philphot, J. D. Robbins, J. A. Abernathy, J. A. Reece, L. B. Bates, G. Cox. President, J. A. Abernathy; vice-president, W. C. Warren; secretary, C. C. Welch; treasurer, W. C. Rowton.

COLUMBUS, O.—By the organization of the Union County Telephone Company, which has been promoted by Frank Beam of this city, Dwight Sapp of Mt. Vernon and capitalists of Marysville and Columbus, all the Independent telephone companies of Union county will be brought under one corporation. The Independent exchanges at Marysville, Ridgewood and other country lines will be united under the new company. After all the counties have been organized in this way it is probable a general holding company for all of them will be formed.

CEDAR RAPIDS, Ia.—The Mid-West Telephone Company is a corporation which has been organized for the purpose of buying up and operating the Independent telephone exchanges in Iowa and Missouri. It has no bonded indebtedness at present, but an issue of $1,000,000 twenty year 6 per cent bonds in denominations of $100, $200, $500, and $1,000 has been authorized, which will be listed on the St. Louis Stock Exchange. The bonds will be offered for sale through the American Securities Company of Cedar Rapids and Crandall & Co. of St. Louis.

ELECTIONS AND MEETINGS

CHEHALLIS, Wash.—The stockholders of the Chehallis-Boisfort Telephone Company have elected the following directors: E. G. Lowry, C. W. Long, Arthur White

JACKSON CENTER, O.—The Jackson Center Telephone Company has elected the following officers: President, W. C. Henrich; directors, Ed. Kreitzer and H. R. Piel.

SOLON, Ia.—The Solon Telephone Company has elected the following officers: President, Dr. J. P. Potter; vice-president, M. T. Loder; secretary, J. J. Fiala; manager, M. A. Randall.

EMMETSBURG, Ia.—The Emmetsburg Telephone Company has elected the following directors: B. B. Kelly, J. F. Dealy, W. I. Branagan, F. Freeman, E. A. Morling, George B. McCarty.

BENTONVILLE, Mo.—The new telephone company at this place has elected the following officers: President, R. Jennings; vice-president, John Neace; Secretary, J. D. Capp; treasurer, J. R. Boring.

WINDSOR, N. Y.—The Lester Telephone Company has elected the following directors: W. B. Twichell, H. A. Williams, A. S. Judd, C. H. Smith, Daniel Jackson, A. H. Moore, A. H. Andrews.

OXFORD, Kans.—The Oxford Rural Telephone Company has elected the following officers: President, D. C. Miller; vice-president, A. C. Whealy; secretary, E. J. Buffington; treasurer, Fred Barns.

WESTFORD, Pa.—The Westford Telephone Company has elected officers as follows: President and manager, J. H. Collins; vice-president, R. F. Blair; secretary, H. D. Bennett; treasurer, J. S. Beckwith.

GOOD THUNDER, Minn.—At a recent meeting the Lyra Telephone Company reëlected its old officers for the coming year. Owing to an increased demand for service the company will construct an additional line.

ROCKPORT, Mo.—The Rockport Mutual Telephone Company recently held its second annual meeting and elected the following trustees: Dr. W. R. Strickland, Dr. J. H. Hedgpeth, H. F. Stapel, George H. Sly, John Burg.

KINDERHOOK, N. Y.—The Coöperative Telephone Company has elected the following officers: President, R. T. Seymour; vice-president, E. B. Gifford; secretary, F. B. Pratt; treasurer, H. A. Branion; manager, P. O. Babcock.

CHERRY VALLEY, Ill.—The New Milford Telephone Company has elected officers as follows: President, T. W. Evans; vice-president, T. L. Cleveland; secretary and treasurer, A. T. Chase; directors, A. L. Chase, Bert Baxter, E. W. Cleveland.

WALKER, Minn.- At the annual meeting of the Cass County Telephone Company the following officers were elected for the coming year: President, F. W. Deline; vice-president, J. O. Jesme; secretary, F. H. Clayton; treasurer, John Clark.

PALESTINE, Tex.—At a meeting of the directors of the Palestine Telephone Company, J. B. Hamilton resigned as secretary and treasurer and was elected vice president. R. H. Hughes was elected as director and was also appointed secretary and treasurer.

INWOOD, W. Va.—The Inwood Rural Telephone Company, recently organized, has elected the following officers: President, E. S. Henshaw; vice-president, J. W. Strong; secretary, John Foreman; treasurer, George W. Mish; general manager, Gray Silver.

DANVILLE, Ill.—The Board of Directors of the Vermillion County Telephone Company has elected the following officers: President, J. H. Davis; vice-president, H. F. Hill; secretary, L. M. Hodges; treasurer, L. D. Gass; auditor, John D. W. Pritchard.

PADUCAH, Ky.—The Paducah Home Telephone Company recently held a meeting for the purpose of electing the local board of directors and for completing arrangements for the improvement of the local service and the enlargement of the company's interests in Western Kentucky.

JOPLIN, Mo.—The directors of the Home Telephone Company have elected the following officers: President, Theodore Gary, Macon; vice-president, John W. Layne, Carthage; secretary, H. E. Scovern, Joplin. The directors include the above officers and Breckenridge Jones and W. H. Warren.

LA GRANGE, Ind.—The stockholders of the Northern Indiana and Southern Michigan Telephone, Telegraph and Cable Company have elected officers as follows for the coming year: President, Dr. A. J. Hostetler; vice-president, F. J. Smith; treasurer, G. H. Ellison; secretary and general manager, J. F. Roop.

CHIPPEWA FALLS, Wis.—The Chippewa County Telephone Company held its annual meeting in this city and the old officers were re-elected as follows: President, Lemuel Richardson; vice-president, Joseph Meloney; secretary, H. V. Bartlett; treasurer, Chas. Liehe; trustees, G. A. Young, S. B. Nommons, L. A. Fletcher.

ANACONDA, Mont.—The stockholders of the Anaconda and Big Hole Telephone Company have effected a permanent organization by the election of the following officers: President, W. R. Allen; vice-president, A. C. MacCalum; secretary and treasurer, George P. Wellcome; directors, E. E. Moore, W. R. Ralston, A. C. MacCalum, W. R. Allen, George P. Wellcome.

BUSHNELL, Ill.—At the annual meeting of the Farmers' Telephone Association, composed of the twenty-two country lines centering in Bushnell, officers for the coming year were chosen as follows: President, I. H. Cheek; vice-president, George Solomon; secretary-treasurer, A. M. Sperry; executive committee, I. H. Cheek, A. M. Sperry, Dr. Holmes, George Solomon, W. E. Spicer.

BELLINGHAM, Wash.—The directors of the Farmers' Mutual Telephone Company recently met in this city and elected the following officers: President, Ed Brown of Custer; vice-president, J. W. Sefton of Everson; secretary, S. F. Bailey of Lynden; treasurer, J. C. Gillies of Nooksack; directors, J. L. Bailey, Nooksack; P. D. Harkness, Everson; L. G. Van Valkenburg, W. H. Jackman, Lynden; L. W. Norton, Blaine.

ROME, N. Y.—At a meeting of the board of directors of the Wire & Telephone Company of America, held at the company's office in this city December 8, the following changes were made: J. S. Dyett, of Rome, was elected president to succeed C. F. M. Niles, of Toledo, Ohio; Oliver Shiras, of Rome, was elected vice-president to suc-

ceed J. S. Dyett; S. H. P. Pell, of the firm of Pell & Co., of New York City, was elected director.

BRITTON, Mich.—The stockholders of the Britton Telephone Company recently held their annual meeting at this place at which time Company recently held their annual meeting at this place at which the capital stock of the company was increased from $2,000 to $4,000 and the following directors were elected for the ensuing year: Wm. Rinn, W. L. Exelby, Jos. Wiggins, Will Hiser, N. H. Ackley, L. S. Palmer, Sam Steele, Jacob Hiser, Ben Haight.

FRAZEYSBURG, O.—The stockholders of the Frazeysburg Independent Telephone Company, which was recently incorporated with a capital stock of $10,000, have elected the following officers: President, Max Frazier; vice-president, Dr. W. S. Drake; secretary and treasurer, S. H. Frazier; general manager, J. B. Rhodes; assistant general manager, Emmett McCann; directors, Max Frazier, Frank Shaw, Samuel Dorsey, Dr. W. S. Drake, J. B. Rhodes.

PORTLAND, Me.—A special meeting of the Northeastern Telephone Company was recently held in this city to consider the advisability of converting a sufficient number of the shares of the common stock in the treasury into preferred stock, so that the capital stock of the company shall be divided into 60,000 shares of common stock and 40,000 shares of preferred stock; also to consider the redemption of the outstanding first mortgage bonds.

INDIANAPOLIS, Ind.—The Toledo and St. Louis interests that now control the Indianapolis Telephone Company and that some time ago decided upon a voting trust agreement for the management of the company for five years have elected the following: James J. Robinson, James S. Brailey, Jr., Breckenridge Jones, W. F. Nolker, E. C. Stifel, Ben Altheimer, A. H. Bauer, and Henry Koehler. The Mississippi Valley Trust Company of St. Louis has been named as the trustee under the voting trust agreement.

BALTIMORE, Md.—At a meeting of the board of directors the following directors resigned: C. I. T. Gould, Charles T. Westcott, John T. Stone, Robert Ramsay. Directors were elected to fill the vacancies as follows: B. N. Baker, Reuben Foster, Sydney L. Wright, W. Frederick Snyder. There will be a change in the management of the company on January 1. Mr. H. W. Webb, the president, has announced his intention of resigning and will probably be succeeded by David E. Evans, who is now vice-president of the company.

LA GRANGE, Ind.—At the recent annual meeting of the Northern Indiana and Southern Michigan Telephone, Telegraph and Cable Company reports showed the past year to have been a very prosperous one for the company and great things are planned for the future. No dividends were declared for the past quarter, but large extensions have been ordered, among which are included new switchboards for the exchanges at La Grange, South Milford, Topeka, Ind., and Constantine, Mich., and a new toll line connecting Orlano, Lima and La Grange.

LEXINGTON, Ky.—The board of directors of the Fayette Home Telephone Company at a recent meeting elected John McClintock, Joseph W. Porter and John Skain directors to fill the vacancies caused by the resignation of A. S. Bowman, James C. Brodie, of Toledo, O., and J. Rogers Barr. John T. Shelby was elected vice-president of the company to succeed A. S. Bowman. The board ratified the action of the executive committee in declaring a semi-annual dividend of one per cent and an extra dividend of one-half per cent on the stock of the Fayette Telephone Company, payable January 4, 1906.

ORDINANCES AND FRANCHISES

SALEM, Ore.—The Automatic Telephone Company has been granted a franchise in Salem.

LAFAYETTE, Mo.—The Lafayette Telephone Company has been granted a twenty year franchise.

WELLINGTON, Kans.—The Winfield Telephone Company of Winfield is seeking a franchise in Wellington.

LAKEFIELD, Minn.—The Tri-State Telephone Company has applied for a telephone franchise in Lakefield.

ONEIDA, N. Y.—Robert J. Fish of Oneida and Cordelia Herrick of Auburn have applied for a franchise in Oneida.

GREENVIEW, ILL.—The Greenview village board has granted a franchise to the Petersburg Telephone Company.

EAST GRAND FORKS, Minn.—A recent election resulted in favor of granting a franchise to the Tri-State Telephone Company.

VALLEY CITY, N. D.—The local telephone system is asking an extension of its franchise preliminary to rebuilding and improving its system.

BISMARCK, N. D.—An ordinance has been introduced in the city council granting a 30-year franchise to the Interstate Electric Telephone Company.

BELLINGHAM, Wash.—The Automatic Telephone Company and the Farmers' Mutual Telephone Company are both seeking a franchise in this city.

WINNIPEG, Man.—Col. T. A. Potter is interested in the formation of the Independent Telephone Company of Manitoba. A bill will be introduced in parliament giving this company the power to build local and long distance lines in every town in the province. G. A. Stewart is solicitor for the applicants.

ROCKVILLE CENTER, N. Y.—A franchise has been granted the New York and Montauk Telephone Company to operate a telephone system in this place.

AMERICUS, Kans.—The Farmers' Telephone Company has been granted a franchise by the city council and the work of construction will begin in the near future.

LA PRAIRIE, Ill.—The La Prairie Telephone Company has secured a franchise to enter Sparland and will probably install a telephone system at that place.

WHEELING, W. Va.—The National Telephone Company has made application for a franchise to operate a telephone system in Woodsville for a period of twenty-five years.

ATTICA, N. Y.—The board of trustees of the village of Attica have granted the Attica Home Telephone Company permission to construct and maintain a telephone system in the village.

HOMER, N. Y.—Messrs. Calhoun of Buffalo and W. S. Dickinson of Messengerville, representing the Inter-Ocean Telephone Company, have made application for a telephone franchise in this village.

COLDWATER, Mich.—The common council has granted a fifteen year franchise to the Wolverine Telephone Company. The company already has an exchange in Coldwater, but has never been granted a franchise.

BRANTFORD, Ont.—The Canadian Telephone Machine Company will apply to the council for a franchise, also the Ontario Independent Telephone Company. Local capital is interested in both companies.

ROANOKE, Va.—The Virginia-Tennessee Telephone Company of Pulaski, Va., has secured a 30-year franchise to construct and operate a telephone system, and arrangements will be made at once for installing it.

RUSTON, La.—The city council has passed an ordinance granting permission for the use of the streets of the city for the installation of a telephone system. A number of prominent citizens are behind the enterprise.

KIRKSVILLE, Mo.—Matthew Muldoon of this city has been granted a twenty year franchise for a home telephone company. The Bell company recently absorbed the exchange in this city owned by J. M. Kennedy.

TACOMA, Wash.—The Automatic Telephone Company, represented by Charles E. Sumner of Portland, has been granted a franchise by the city council to install an automatic telephone system costing $500,000.

GREENSBORO, N. C.—The North State Telephone Company has made application for a franchise to operate a telephone line connecting Greensboro with points in Randolph, Davidson, Montgomery and Moore counties.

VANCOUVER, B. C.—W. J. Arment of Portland, Oregon, representing the Home Telephone Company, will ask a franchise from this city for the installation of a million dollar telephone plant, the wires to be placed under ground.

SAN JOSE, Cal.—The Home Telephone Company of Los Angeles will appear before the Board of Supervisors to apply for a franchise for a complete telephone service throughout the county. An up-to-date telephone system has been guaranteed.

SALEM, Wash.—The city council has passed an ordinance granting a franchise to the Automatic Telephone Company. The ordinance as passed requires the company to pay the city $10,000 in cash for the franchise, and when the exchange is completed and in operation the company must pay the city annually 3 per cent of the gross income. The promoters promise to begin work on the construction of the plant at once.

NEW ORLEANS, La.—A. Von Hoffman of Milwaukee, Wis., promoter of the Registering Telephone Company, is seeking a franchise to establish a telephone system in this city. An ordinance has been drawn and is ready to present to the city council. Mr. Von Hoffman states his company stands prepared to expend $5,000,000 in the construction of a telephone system in New Orleans, this to be the first of a number of southern cities to be invaded.

MONTEREY, Cal.—The Independent Telephone Association of Los Angeles holds a meeting each month at the Del Monte Hotel, Monterey, for the purpose of discussing questions bearing on the different phases of telephone management and construction. The association is composed of the various Independent companies in southern California. The Independent companies represent about $5,000,000 in stock and some $3,500,000 in bonds, nearly all held by residents of southern California.

WEST PALM BEACH, Fla.—The stockholders of the old telephone company, with one exception, have signed the release giving the city the right to annul its franchise without process of law, and it is believed the remaining stockholder will consent at an early date. It is stated that a newly organized company is ready to submit a proposition to the city as soon as the old franchise is out of the way, and that if franchise is granted to them work on the new system will be commenced about January 1.

MARION, Ind.—Indianapolis, Muncie, Chicago and Marion capitalists, represented by O. L. Barger, have been granted a franchise

by the board of public works to place a telephone system in this city. The rates to be charged are $1.50 a month for residences and $2.50 for business houses, no charges to be made for use of any telephone until 1,000 have been placed. A tax of 66 2-3 cents for each telephone will be paid annually into the city treasury. Construction of the plant is to begin in four months, to be completed in eighteen.

OAKLAND, Cal.—The city council has formally ratified the action taken in awarding a franchise to the Home Telephone Company of Alameda county to operate a telephone system in Oakland. Representatives of the company have deposited with City Clerk Thompson $31,887.97, which was the 90 per cent due on its bid of $35,431.30 for the franchise. They also filed a bond of $100,000 guaranteeing that the terms of the franchise would be fulfilled. The bondsmen are J. S. Torrance, P. E. Bowles, Mark L. Gertsle, T. W. Phillips and William Thomas.

GALESBURG, Ill.—Lafayette Weinberg, vice-president of the Galesburg Union Telephone Company, has introduced an ordinance asking a perpetual franchise for his company. The reasons given for asking for a new franchise are that the capital stock has been increased from $150,000 to $250,000, and the new bonded indebtedness will run a number of years past the life of the present franchise, and that the present franchise contains a number of dead letter features. The company will place its wires in the heart of the city under ground and will improve its toll system.

NEW YORK, N. Y.—The Atlantic Telephone Company has sent to the board of estimate and apportionment a revised application for a franchise to do business in this city. The company agrees to pay to the city $7,750,000 in cash for the franchise, apportioning the payments over the entire period of twenty-five years. By the company's offer the city would receive annually $77,500 for the first five years, $116,250 for the second five years, $155,000 annually for the third five years, $193,750 annually for the fourth five years, and $232,500 annually for the fifth five years. The company also agrees to give the free use of 1,000 telephones to the city. The company claims to have contracts to install 75,000 telephones in the city.

NEW CONSTRUCTION

ELDORADO, Tex—B. E. Earle will install a telephone plant in this city.

NAMPA, Idaho.—An entirely new telephone system will be installed in this city.

OXFORD, N. Y.—The Oxford Valley Telephone Company will construct additional lines.

MAZATLIN, Mex.—The port of Mazatlin will be supplied with an up to date telephone plant.

AURORA, Ind.—Ernest W. Swarthout of this place will erect a telephone exchange at Dillsboro.

STARBUCK, Minn.—The White Bear Telephone Company will establish an exchange at this place.

COBDEN, Minn.—The Cobden Telephone Company contemplates the construction of additional lines.

PASSER, Pa.—The Passer Telephone Company will construct a line from Passer to Pleasant Valley.

PARADISE, Tex.—Rev. D. Briggs of Paradise contemplates the construction of rural telephone lines.

HARTLAND, Me.—The Hartland and St. Albans Telephone Company will build a line to East Palmyra.

ABERDEEN, Wash.—A new telephone exchange will be installed in Aberdeen at an estimated cost of $20,000.

PRINCETON, Ill.—The Bureau County Telephone Company will install new equipment in its plant in this city.

OAKVILLE, Ia.—The Oakville Telephone Company will construct a telephone line from this place to Toolesboro.

ELMORE, O.—The New Ottawa County Telephone Company will construct a line from Middle Bass to North Bass.

PIPESTONE, Minn.—The Tri-State Telephone Company has been granted permission to establish a toll system in this place.

SHAW, Ore.—Owing to increased business, the Waldo Hills Telephone Company will build a line from Shaw to Salem.

MT. BLANCO, O.—The Point Rock-Wilkesville Telephone Company will build a telephone line from Mt. Blanco to Prattsville.

HOLLISTER, Cal.—George Burg has been granted a franchise to build a telephone line from Panoche to New Idria.

COLUMBUS JUNCTION, Ia.—The Muscatine-Louise County Telephone Company will install an exchange at this place.

WENTWORTH, N. C.—James V. Price and Samuel Ellington will construct a telephone line from Wentworth to Madison.

ST. MATTHEWS, S. C.—E. Wimberly, G. A. Baxter, J. S. Wannamaker and others will establish a telephone system at this place.

DE QUEEN, Ark.—The Party Telephone Company will construct a line connecting Gillham, De Queen, Grannis and other points.

DALZELL, ILL.—S. H. Brakel has been granted the right to construct and maintain a telephone system in the village of Dalzell.

FARGO, N. D.—The Tri-State Telephone Company is constructing a line between this city and Ardoch. The company will build lines to Minto, Grafton and a number of other towns, which will be completed early next year.

WALDRON, Ind.—A local telephone system will be installed by Elmer E. Moore and will be known as the Moore Telephone Company.

DRESDEN, Kans.—The Farmers' Telephone Company of this place will begin the construction of its line as soon as material can be secured.

LOWELL, Ind.—The Lowell Telephone exchange was recently destroyed by fire. A new exchange with modern apparatus will be installed.

UNIONTOWN, Ky.—The Uniontown Telephone Company is installing a new switchboard and otherwise improving and extending its lines.

JAMESTOWN, N. D.—The Interstate Telephone and Electric Company will extend its lines west from Jamestown and Linton to Miles City, Mont.

FREEPORT, Ill.—Richardson & Shuster have secured contract to install a complete telephone system in the Raleigh Medical Company's plant.

ABERDEEN, S. D.—The Dakota Central Telephone Company of Aberdeen contemplates the construction of a local exchange at Linton, N. D.

PERRY, N. Y.—The Inter-Ocean Telephone Company has secured the right of way into Perry and construction work will begin at once.

BOISE, Idaho.—The Idaho Independent Telephone Company of Boise has advertised for bids for the construction of a telephone exchange building.

NYE, Mont.—B. F. Pratton, E. J. Douthworth, W. J. Lyons and B. M. Marshall of Nye have been granted permission to construct a private telephone line.

MCEWAN, Tenn.—Dr. Robertson and P. J. Fuqua are interested in the construction of a telephone line from McEwan through Humphreys county.

WILLACOOCHEE, Ga.—W. M. Denton will establish a telephone exchange at this place, work to begin at once. The line will probably be extended to McDonald.

PRESTON, Minn.—Mr. Solie of the People's Telephone Company contemplates putting in an up to date exchange and has already secured a good list of subscribers.

PADUCAH, Ky.—The Paducah Telephone Company will reconstruct its exchange at Marion. It is estimated that more than $15,000 will be spent in improvements.

LOGANSPORT, Ind.—The Indianapolis Independent Telephone Company has made arrangements for installing a big toll lead from Indianapolis to this city to take care of congested conditions.

PERRY, Ia.—The Hawkeye Telephone Company is replacing its line between this place and Des Moines with a copper line. The local lines will also be rebuilt at this place to give better service.

GLENWOOD, Wis.—The Twin City Telephone Company will construct a long distance telephone line from Hersey to Glenwood, where it will connect with the West Wisconsin Telephone Company.

FAIRMONT, Minn.—At a recent meeting of the board of directors of the Fairmont Telephone Company President Matson was authorized to establish rural telephone lines where most needed and have same built as soon as possible.

DEAVERTOWN, O.—Residents of York township, who are principally farmers, are preparing to construct an Independent telephone line from Deavertown through York township. Elmer E. Fletcher is named as among the interested parties.

MEADOWS, IDAHO.—The Meadows-Warren-Roosevelt Telephone Company, recently incorporated with a capital stock of $50,000, has arranged to build telephone lines from Meadows to Van Wyck and from Meadows to Grangeville.

CATHLAMET, Wash.—The North Shore Telephone Company will construct a telephone line connecting McGowan, Cathlamet, Gray's River, Skamokawa, Knappton, Frankfort and intervening points. Brix Brothers are interested in the project.

FERNDALE, Wash.—The Merchant Telephone Company will at once begin the installation of an exchange in Ferndale. A trunk line has recently been completed from this place to Bellingham which connects with long-distance service at that point.

NIAGARA FALLS, N. Y.—It is stated that the Niagara, Lockport and Ontario Power Company will construct a telephone line along the route of its power transmission line from Niagara Falls to Syracuse. William Gibbony of Buffalo has charge of the work and has opened an office at Lockport.

TERRE HAUTE, Ind.—The Citizens' Telephone Company has purchased a site for its new exchange at a cost of $4,500. Plans are being prepared for the erection of a new building. Up to date equipment will be installed and it is estimated that the cost of erecting and fitting the building will reach about $100,000.

NOME, Alaska.—The Seward Co-operative Telephone Company, which was incorporated in Nome during the summer, has for its ultimate object the covering of all the populated sections of Alaska with a network of telephone lines, extending north from this place wherever mining is in operation and up the Yukon river to Fairbanks and thence to Valdez, through the Copper River section, touching the mining centers where the business justifies it. A

large amount of capital will be required, as the cost of construction will be very heavy, necessitating as it does the hauling of material many miles into the interior, but its backers have every assurance of sufficient money to carry the deal through.

PINE GROVE, Wis.—The Brown County Telephone Company, recently incorporated, will install an exchange at this place with lines extending to all parts of the county. The system will be pure metallic circuit with long distance connections. Charles A. Straubel is president of the company and Senator Henry F. Hagemeister vice-president.

EXTENSIONS AND IMPROVEMENTS

Owosso, Mich.—The Farmers' Telephone Company will install a new switchboard.

JACKSON, Ga.—Kinard & Buttrill are arranging to rebuild the local telephone exchange.

LUDINGTON, Mich.—The Lake Shore Telephone Company will make improvements in its system.

PENFIELD, Ill.—Coon Brothers are preparing to build a telephone line from Penfield to Armstrong.

TRAVERSE CITY, Mich.—The Traverse Bay Telephone Company will install an exchange at Bellaire.

SAGE, Wyo.—The Unita-Rich Telephone Company will extend a telephone line from Sage to Cokeville.

LONDON, ARK.—The London Telephone Company is making important improvements in its system.

SODUS POINT, N. Y.—The Wayne-Monroe Telephone Company will establish an exchange at this place.

MEDICAL LAKE, Wash.—The Medical Lake Telephone Company will make important improvements and extensions.

SHERMAN, Tex.—The Sherman-Gainesville Telephone Company will construct a line between this city and Whotesboro.

CHEROKEE, Kans.—The Farmers' Rural Telephone Company expects to establish an exchange at this place in the near future.

MILBANK, S. D.—The Grant County Telephone Company will extend its lines to South Shore and Summit, a distance of thirty-five miles.

GALESBURG, Ill.—The Galesburg Independent Telephone Company will erect a new exchange building and also install a new switchboard.

MANAWA, Wis.—U. S. Briggs has purchased the telephone system at this place and will construct a new line to Little Wolf and other points.

LIBERTY HILL, Tex.—J. F. Parker of Liberty Hill announces that the rural telephone lines centering at that place will install a switchboard.

CLINTON, Ill.—B. F. Wasson of the National Telephone & Electric Company has let the contract for a new telephone office building in this city.

CLAYTON, IND.—The Clayton Telephone Company is now owned by R. D. Stone, who will at once begin extensive improvements and extensions.

WOODSFIELD, O.—The Woodsfield Telephone Company is making a number of improvements in its system, enlarging the same to a capacity of 1,000.

SCHENECTADY, N. Y.—The Schenectady, Delanson & Esperance Telephone Company is considering the construction of a telephone line to Gallupville.

TABOR, Tex.—C. W. Covington of this place has sold his interest in the line between Bryan and Wheelock to J. F. Castle, who will make improvements.

WINDHAM, O.—The Windham Telephone Company, which is constantly adding to the number of its subscribers, contemplates the extension of its plant in the near future.

PLEASANTON, Neb.—The Buffalo County Telephone Company, with headquarters at Kearney, is building farmers' lines into Pleasanton, where it will install a switchboard.

PADUCAH, Ky.—The Independent Telephone Company has closed a deal whereby it comes into possession of the Independent telephone lines at Benton and in Marshall county.

CONNELLSVILLE, Pa.—The present capacity of the Tri-State Telephone Company being practically exhausted in this city, another section of switchboard will be added in the near future.

LOCKPORT, N. Y.—The Lockport Telephone Company has under consideration the erection of a new exchange building and the installation of a new switchboard in the near future.

ITHACA, N. Y.—The Ithaca Telephone Company is planning extensive improvements in its system, which will make it one of the best equipped in the state. Work will begin about January 1.

LITCHFIELD, MINN.—The Litchfield Telephone Exchange Company has let the contract for the erection of a new exchange, to be completed by January 1, when a new common battery system will be installed.

NEW HARTFORD, Ia.—The Farmers' Mutual Telephone Company will be operated in the future under the name of Sprague & Paulger. A number of farmers' lines will be built, the Parkersburg, Dike and New Hartford exchanges will be completed and the system put in first class order. F. W. Paulger has purchased a half interest in the company.

MIAMI, Fla.—The Miami Telephone Company has under consideration the extension of its system to West Palm Beach. About $12,000 will be expended at present and later the line may be extended to Jacksonville.

DOVER, Dela.—The Diamond State Telephone Company of this city anticipates a great increase of business during the year 1906 and is making arrangements to meet the requirements of the development of the telephone service in the state.

TROY, Pa.—At a recent meeting of the board of directors of the Citizens' Telephone Company, held in this city, plans for the betterment of the service were discussed. Reports showed the financial condition of the company to be satisfactory.

WEATHERFORD, Tex.—The deal by which the Riddel exchange at this place was sold to Clark & Thomas has been declared off and Mr. Riddel is now making further improvements and extensions. The lines of the company may be changed to copper metallic.

ALLENTOWN, Pa.—At a meeting of the Board of Directors and the Executive Committee of the Consolidated Telephone Company, orders were placed for the installation in this city of an exchange of 4,000 lines, and similar exchanges of smaller capacity in Hazleton and Emaus. The improvements will cost $100,000.

CELAYA, Mex.—The Celaya Telephone Company, which has just completed the installation of a telephone system in this city, has for its object the connection of all places of importance in the state of Guanajuato by telephone, and the directors and shareholders are confident that this plan will be realized within a very short time.

INDIANAPOLIS, IND.—The Indianapolis Telephone Company, which recently changed hands, will erect a new exchange building and will increase the capacity of the plant. It is the policy of the New Long Distance Telephone Company to extend toll lines into every city and many of the smaller towns of the state, connecting them with this city. The company has appropriated $100,000 for toll extensions.

POTTER, Mo.—Negotiations are pending for the addition of the telephone lines centering in Shambo Ferry and Anderson to the Potter Telephone Company, one of the largest Independent companies in the state, controlling several exchanges and a number of copper toll lines. This will extend the facilities for Independent telephone communication in this section of the country and will connect many additional subscribers with the Potter company.

ALBION, Ind.—The Noble County Telephone Company has just issued a directory which shows a list of over 400 subscribers and new telephones are being added as rapidly as they can be installed. It is the intention of the company to construct a line in the northern part of the county in the spring, touching Brimfield, Rome City, and other points. When this improvement is completed the company will have one of the most complete and modern telephone equipments in this part of the state. The company is composed of men of standing and business ability, and it is their intention and purpose to make the service second to none.

Moscow, Idaho.—Manager E. E. Craneall of the Inter-state Co-operative Telephone Company, with headquarters in this city, is making an effort to construct a line to Lewiston. The company already has a line connecting with Leland and all along this line service is desired with Lewiston. This company owns over 350 miles of telephone lines in Washington and Idaho and is one of the strongest Independent companies in these states, having exchanges in Palouse, Pullman, Troy and Moscow. The officers of the company are as follows: President, E. H. Patton; secretary andt treasurer, J. N. Torner; manager, E. E. Craneall. It is the intention to enter Spokane next year.

WILLIAMSPORT, Pa.—Through contracts just completed the United Telephone Company will at once begin the construction of a short line of trunk wires, which will give the company through communication between Rochester and Buffalo on the north and Philadelphia, Baltimore and Washington on the south. These connections when completed will greatly strengthen the position of the United company in this part of the state. Among the companies included in the agreement are the following: Ralston Telephone Company, extending from Williamsport to Roaring Branch; the Loyalsock Telephone Company, Muncy Creek Telephone Company, White Deer Telephone Company, Salladasburg Telephone Company.

FINANCIAL NOTES

BRISTOL, Pa.—The Keystone Telephone Company of Philadelphia will apply for a franchise in Bristol.

MADELIA, Minn.—The Madelia Telephone Company has declared a semi-annual dividend of 6 per cent.

TROY, N. Y.—The Commercial Telephone Company has declared a semi-annual dividend of 3 per cent.

TAYLORVILLE, Ill.—The Christian County Telephone Company has increased its capital stock from $100,000 to $250,000.

ST. LOUIS, Mo.—The Central Telephone and Electric Company of this city has filed a statement showing an increase in its capital

stock from $50,000 to $75,000, all the increase paid. Assets, $105,736.07; liabilities, $25,836.07.

INDIANAPOLIS, Ind.—The New Long Distance Telephone Company has declared a quarterly dividend of 1 per cent, payable January 10.

UNION SPRINGS, N. Y.—The Woodworth Telephone and Telegraph Company has increased its capital stock from $15,000 to $30,000.

MANSFIELD, Tex.—The Mansfield Telephone Company has filed an amendment to its charter increasing its capital stock from $8,000 to $16,000.

HAMILTON, O.—The Hamilton Home Telephone Company has declared its eleventh quarterly dividend of 1 per cent on its common stock.

MONTELL, Tex.—The Citizens' Telephone Company of Montell has filed an amendment to its charter increasing its capital stock from $1,000 to $2,000.

DILLON, Mont.—The Southern Montana Telephone Company has increased its capital stock from $5,000 to $15,000. The lines of the company will be extended.

HIGH POINT, N. C.—The North State Telephone Company of this place has made application for a franchise to operate a telephone system in Greensboro.

DOYLESTOWN, Pa.—A franchise has been granted to the Keystone State Telephone Company with the stipulation that an underground system shall be installed.

TEMPLETON, Mass.—A franchise has been voted to the Otter River Telephone Company by the selectmen to construct and maintain a telephone system in Templeton.

AUSTIN, Tex.—The Texas Consolidated Long Distance Telephone Company of Dallas, has filed an amendment to its charter increasing its capital stock from $120,000 to $240,000.

NEW BRITAIN, Conn.—The Farmington Valley Telephone Company has filed a certificate of increase of capital stock from $27,000 to $54,000 by increasing the number of shares from 1,080 to 2,160.

MINNEAPOLIS, Minn.—The directors of the Tri-State Telephone & Telegraph Company have declared the tenth quarterly dividend at the rate of 6 per cent per annum on the preferred capital stock of said company, payable December 1, 1905.

CLEVELAND, O.—The Cuyahoga Telephone Company has declared a 3 per cent semi-annual preferred dividend, payable January 5, and the United States Telephone Company pays its quarterly 1½ per cent dividend on preferred on the same date.

JACKSONVILLE, Ark.—The Jacksonville Telephone Company has filed an amendment to its articles of incorporation increasing the capital stock from $1,000 to $10,000. S. W. Murtishaw is president of the company and Minnie S. Stone secretary.

NEWARK, O.—The Newark Independent Telephone Company's exchange has grown from 600 subscribers in 1902 to 2,026 in November, 1905, and to meet the demand for an extension of the lines $50,000 6 per cent non-taxable preferred stock will be issued.

NORTH YAKIMA, Wash.—At a recent meeting of the city council W. P. Freligh and A. H. Greenberg of Seattle made application for a telephone franchise for a period of fifty years. The applicants agree to have 1,000 telephones installed within one year after commencing work.

PHILADELPHIA, Pa.—The voting trustees of the Keystone Telephone Company have filed an application with the Philadelphia Stock Exchange for the listing of the $2,750,000 voting trust certificates. These represent an equal amount of common stock deposited with the trustees.

HAMILTON, O.—The Hamilton Home Telephone Company has declared its eleventh quarterly dividend of 1 per cent on its common stock. The company has had an unusually prosperous year, having increased the number of its subscribers over 1,000. W. Gilbert Thompson is general manager of the company.

DALLAS, Tex.—The Texas Consolidated Long Distance Telephone Company, which has just completed a long distance toll line between Fort Worth and Dallas, has secured a franchise from the city of Dallas for a long distance business exclusively. The company expects to have 200 telephones installed in the city before the close of the year.

CLEVELAND, O.—At a meeting of the board of directors of the United States Telephone Company and the Cuyahoga Telephone Company, held recently, arrangements were completed for a loan for each from the St. Louis syndicate which has an option of the Federal. The money will be used to pay for improvements and extensions made recently.

ASHEVILLE, N. C.—A meeting of the directors and stockholders of the Asheville Telephone and Telegraph Company was recently held for the purpose of devising ways and means for raising the money necessary for the new plant to be at once installed in this city to cost about one hundred thousand dollars. It is understood that work will begin at once.

INDEPENDENCE, Mo.—The Home Telephone Company, through its president, Theodore Gary, of Macon, Mo., has filed a mortgage deed of trust in Independence, in favor of the Pioneer Trust Company of Kansas City to secure $150,000 in bonds recently authorized. The bonds are to run for 20 years at 5 per cent. Of the amount of money to be raised by the sale of the bonds, $50,000 is to be used in paying for the plant as it now is, $25,000 in immediate improvements, and $75,000 as a reserve for future improvements.

COLUMBUS, Ind.—The Citizens' Telephone Company of this city has served notice on its patrons that after January 1 rates will be advanced. The present rates are $12 and $15 for residences and $24 for business houses, and under the new schedule, the price for residences will be $15 and $20, and for business houses $30. The raise will probably meet with opposition.

LEXINGTON, Ky.—Activity in Fayette Home Telephone stock on the exchange during the past few days is due to rumors of increased earnings as a result of the raising of rates, which took effect November 1. It is stated the company will declare a half yearly dividend of 1½ per cent, payable January 1. A meeting of the directors will be held on the 5th inst. to act in this matter.

PITTSBURG, KANS.—The Citizens' Home Telephone Company, the new company formed by the merger of the various Independent companies of Crawford, Cherokee, Labette and Montgomery counties, including the Home Telephone Company of this city, has given a mortgage or trust deed for $500,000 to the Fidelity Trust Company of Kansas City, covering the home exchange in this city. J. A. Plothner, who was formerly president of the exchange here, is at the head of the merger.

NEWARK, O.—The stockholders of the Newark Independent Telephone Company recently held a meeting for the purpose of voting on a proposition to sell $50,000 of the 6 per cent preferred stock. The company has a paid in capital stock of $135,000 and its plant is valued at about $210,000. The company will sell the issue of 6 per cent non-taxable preferred stock for the purpose of extending its lines and to meet the demands of its growing business. The number of subscribers has grown from 600 to 2,000 in three years.

NEWARK, O.—Brokers of Columbus are offering for sale at par $50,000 of the preferred stock of the Newark Telephone Company. The company was incorporated in 1894 under the laws of West Virginia with a capital stock of $20,000. The growth of the exchange made necessary the increase of this to $100,000, of which $60,000 was common and $40,000 preferred. A further increase of $50,000 has been made in the preferred issue and it is this which is being offered to investors. The preferred stock pays 6 per cent dividends and the common stock 8 per cent. The company has but $35,000 of bonded indebtedness.

BAITING HOLLOW, N. Y.—The board of directors of the Baiting Hollow and Roanoke Telephone Company has voted to ask the stockholders to authorize the increase of its capital stock from $20,000 to $50,000. This company began a few years ago with a capital of $5,000, which was increased to $20,000, and now a further increase is desired. The increased capital will be used to extend the company's business. The system was installed by farmers as an up to date farming scheme and they believe it has been a money maker for them on this line alone; beside this the company has annually paid big dividends to the stockholders.

PERSONAL MENTION

ABBOTT, TEX.—Harry Legan has purchased the telephone plant at this place.

GALLIPOLIS, O.—A. Kratz has been appointed manager of the Gallipolis Telephone Company.

SLEEPYEYE, Minn.—Hugh McKenzie has been appointed manager of the local telephone company.

BALDWIN, KANS.—A. B. Bruner has purchased the business of the Baldwin Telephone Company.

TYLER, Tex.—E. Posey has been appointed manager of the Citizens' Telephone Company of this city.

TUSCARAWAS, O.—J. K. Johnson has been appointed general manager of the Home Telephone Company.

EBENSBURG, Pa.—Harry W. Johnson has been appointed manager of the Ebensburg Telephone Company.

WASHINGTON, Ind.—W. H. Wallace has been appointed manager of the Home Telephone Company at this place.

PENN YAN, N. Y.—M. H. Kennan of Ludington, Mich., has been appointed manager of the Penn Yan Telephone Company.

ELKHART, Ind.—F. P. McIntosh, of Chicago, has taken a position with the Chicago Telephone Supply Company of Elkhart.

NORTHFIELD, Minn.—J. W. Qathey, of Minneapolis, has been appointed local manager of the telephone system in this city.

IOWA CITY, Ia.—Mayor George W. Ball of Iowa City has been elected president of the Johnson County Telephone Company.

GREEN BAY, Wis.—Mr. Frank Carswell has been appointed local manager of the new Fox River Valley Telephone Company at this place.

MARSHALL, Ill.—Mr. Andy Patterson, of Streator, has been appointed manager of the Kinloch Telephone Company's exchange at this place.

ELWOOD, Ind.—C. W. Foster has been appointed superintendent of the Delaware and Madison Counties Telephone Company's plant at this place.

CLEVELAND O.—Charles Y. McVey, who has been assistant general manager of the Federal Telephone Company for some years,

has been made general manager of the company to succeed James B. Hoge.

GOLDFIELD, Nev.—C. H. Gordon is promoting the organization of a company for the purpose of constructing a telephone line between Goldfield and Lida.

ALVORD, Tex.—Mr. Nichols of the Alvord Telephone Company, contemlates building a line to Decatur and organizing a company to install an exchange at that place.

CEDAR RAPIDS, Ia.—Edward Ilton of this city is now sole proprietor of the Eldon Home Telephone Company, having recently purchased his partner's interest in that system.

RICHWOOD, O.—J. L. Sayre of this place is organizing a telephone company to build and operate a telephone exchange at Ostrander. He will also build lines in the territory between Marysville and Delaware.

AURORA, Neb.—Mr. Joe Hynes has been appointed manager of the Hamilton County Telephone Association. This is one of the largest companies in the state, controlling seven exchanges and giving service to about 1,800 farmers.

ST. LOUIS, Mo.—Mr. L. G. Le Bourveau, formerly manager for the Telephone Department of Ewing-Merkle Electric Company, has accepted a position as sales manager for the Central Telephone and Electric Company, St. Louis, commencing December 1st.

CLEVELAND, O.—General Manager McVey of the Federal Telephone Company is rapidly getting the U. S. Telephone Company on a better operating basis. The company is said to be doing very well and making nice increases in its gross earnings as a result of the new money put in it and as a result of the growth of the property generally.

SEYMOUR, Ind.—Fred C. Whitcomb, manager of the Seymour Home Telephone Company, has been appointed organizer for the eleventh district of the Indiana Independent Telephone Association. This district is composed of the following counties: Jackson, Bartholomew, Brown, Dearborn, Decatur, Jefferson, Jennings, Ripley, Ohio and Switzerland.

MOORHEAD, Minn.—Manager Welter of the Red River Telephone Company is engaged in installing a new device, which, as he expresses it, makes two telephone lines out of one. The new device will be installed on the line between Moorhead and Ada. It is claimed for the invention that it will make it possible to use a line as a toll line and at the same time as a private line without either party being able to hear the conversation of the other, and in this way it is possible to secure the service from one line which formerly required two.

ROCHESTER, N. Y.—W. A. Shimer of Rochester has recently perfected a device for taking up the slack cord on a desk telephone. The cord is wound upon a reel in the base of the standard of the telephone and the reel is controlled by the hook on which the receiver hangs. When the receiver is taken from the hook the reel locks, leaving any length of cord out that may be desired. When the receiver is returned, the reel is released and the slack cord taken up. The cord in this way is kept straight and the wear on the insulation is said to be lessened. Mr. Shimer has patented his device.

UNDER-GROUND CONSTRUCTION

MUSCATINE, Ia.—The Mississippi Valley Telephone Company will place its wires under ground in this city.

QUINCY, Ill.—The city council will take steps to compel all companies operating electrical wires to place same under ground.

LA PORTE, Ind.—The La Porte Telephone Company is making arrangements to lay 3,000 additional feet of conduit for underground cable and wires.

TERRE HAUTE, Ind.—The city council at a special meeting passed an ordinance granting the Citizens' Telephone Company the right to lay conduits in certain portions of the city.

INDIANAPOLIS, Ind.—The Indianapolis board of public works has approved the plans of the Indianapolis Telephone Company for putting its wires under ground on the north side of the city.

ST. LOUIS, Mo.—The board of public improvements is considering the question of placing the electric and other wires around the county poor house under ground, and contract will probably be let at an early date.

ST. PAUL, Minn.—As an inducement to place telephone and telegraph wires under ground it has been suggested that a tax be levied on each pole in the city. It is thought a license of $5 a pole would be a strong inducement towards getting the wires removed from the streets.

TERRE HAUTE, Ind.—The Citizens' Telephone Company has submitted to the Board of Public Works for its inspection an agreement the company proposes to enter into with the city for the right to extend its underground conduit system in the near future. If the agreement is entered into the work on the extension of the conduits will be undertaken at once, which means an outlay of at least $35,000.

REORGANIZATIONS

TAMA, Ia.—The Tama telephone exchange has been purchased by W. C. Fidler for a consideration of $11,000.

EDGERTON, Mo.—Linney Brothers & Head have purchased the telephone business of Stone & Gwin in this city.

PHILLIPSBURG, Kans.—The Enterprise Telephone Company has purchased the local telephone system at Kerwin.

NORTH JUDSON, Ind.—F. D. Pixa has sold his interest in the telephone exchange to George M. and Oscar B. Smith.

BARNUM, Minn.—The telephone system in this place, formerly owned by J. S. Cain, has been purchased by Ray Giberson.

BUSHTON, Kans.—The Bushton Telephone Company, formerly owned by S. E. Heinly, has been purchased by D. L. Katterjohn.

BROCKPORT, N. Y.—The Rochester Telephone Company has purchased a controlling interest in the Brockport Telephone Company.

EFFINGHAM, Kan.—J. C. Valentine of Effingham has purchased the Effingham telephone plant formerly owned by business men of Clyde.

KERRVILLE, Tex.—The Kerrville Telephone Exchange has purchased the Rock Springs exchange and will at once greatly improve the same.

COLMAN, S. D.—Miller Brothers, proprietors of the Flandreau and Egan telephone systems, have purchased the Colman Telephone Company.

BLACKSTONE, Mass.—The local telephone system, owned by Hon Jeremiah Gatchell, has been purchased by the Providence Telephone Company.

BATH, N. Y.—The Pleasant Valley Telephone Company, recently incorporated at Hammondsport, has taken over the Niver rural telephone lines leading from Bath to many outlying rural points. The company will greatly develop the system.

HERKIMER, N. Y.—D. J. Devendorf, as attorney for S. Cadence Devendorf, who owned and operated a rural telephone line, has sold the same to the Union Telephone Company of Albany for a consideration of $1,725. The system is located in the towns of Herkimer, German Flatts, and Little Falls.

WATERLOO, Ia.—The Corn Belt Telephone Company has filed a bill of sale granting all rights and privileges held in a telephone line extending from Hudson, to the Hudson Home Telephone Company. The sale includes all rights over the lines and all connections radiating from said main line, amounting to between thirteen and fourteen miles. Consideration, $312.

AMHERST, N. S.—The property and plant of the Cumberland Telephone Company of Amherst has been sold at auction for the sum of $14,000. The company was organized over three years ago with a capital stock of $50,000, all subscribed by Cumberland county people, of which 20 per cent was paid in. The company had over 70 miles of line in operation and 350 telephones in service, and had spent $19,000 on its system.

CANTON, Mo.—The Lewis County Telephone Company, which was recently sold under a deed of trust, has been reorganized under the name of the Northern Missouri Telephone Company, with head office at this place. The capital stock of the new company is $35,000. The following officers have been elected: President, G. W. Morehand; vice-president, O. C. Clay; secretary, C. M. Bradshaw; treasurer, W. B. Hinton; executive committee, O. C. Clay, T. C. Yeager, C. M. Bradshaw.

ZANESVILLE, O.—The Zanesville Telephone & Telegraph Company has secured control of the Farmers' & Merchants' Telephone Company of Frazeyburg, a county organization, and will connect it directly with the exchange at Zanesville. At a meeting of the stockholders the following officers were elected: President, Max Frazier; vice-president, Dr. W. S. Drake; secretary and treasurer. S. H. Frazier; general manager, J. B. Rhodes; assistant general manager, Emmet McCann; directors, Max Frazier, Frank Shaw, Nathan Nethers, S. H. Frazier, Samuel Dorsey, Dr. W. S. Drake, and J. B. Rhodes.

OWENSBORO, Ky.—A deal has been closed whereby Newman Birk of this city acquires a controlling interest in the Rough River Telephone Company, a concern doing business principally in Ohio county and having exchanges at Hartford and Beaver Dam. The company has long distance connections with a large and important territory. It is the most thoroughly equipped of the Independent companies and is now, and has been almost since its organization, doing a good business. Mr. Birk is also secretary and treasurer of the Home Telephone Company of Daviess county, and although the two systems will be closely allied, they will be operated separately. The system also connects with the Home Telephone Company of this city.

MILWAUKEE, Wis.—J. P. Smelker of Dodgeville, Wis., representing some of the bondholders of the Independent Consolidated Telephone Company, was the purchaser of the greater part of the property of that concern at the sale held recently by John H. Reilly, receiver. It is evident that the entire assets of the company will bring less than $15,000, the book value of which is $274,000, representing an actual expenditure of $100,000. A. J. Smith of Milwaukee was the successful bidder for the exchanges at Barneveld and Ridge-

man and about fifty miles of poles and wire in the vicinity of Dodgeville. The price bid was $850. A section was also purchased by L. W. Burch. The section purchased by Mr. Smelker includes the exchanges, wires, and poles in Grant county. The price bid was $5,500.

LEGAL ITEMS

KEOKUK, Ia.—J. C. Hubinger of Keokuk has brought suit against the Kahoka Telephone and Construction Company, Kahoka, Mo., for several shares of stock alleged to be his property, and for which he claims he can secure no satisfactory settlement.

ONALASKA, Wis.—Mrs. Lillie Showers of Onalaska will bring suit against the La Crosse Telephone Company for $5,000 damages for the death of her husband, which is claimed resulted from negligence on the part of the company in the proper induction of its wires.

COLUMBUS, O.—In the case of the Queen City Telephone Company against the city of Cincinnati the Supreme Court affirms the judgment of the Circuit Court, which was against the Queen City company By this decision the Independent telephone companies continue to be shut out of the city.

PORTLAND, Me.—The minority stockholders of the Northeastern Telephone Company, who are dissatisfied at the action of the majority members at the annual meeting held recently, have filed a bill in equity asking for a temporary injunction restraining the company from taking the action voted at said meeting.

CARLISLE, Pa.—In the suit of the United Telegraph and Telephone Company against the borough of Carlisle, Judge Sadler to-day handed down an opinion fixing the annual tax on telegraph poles in the borough at 10 cents each instead of 75 cents. This is the first decision in the state under the law giving the courts power to fix the tax.

LEWIS, Kans.—The stockholders of the Mutual Telephone Company have elected the following officers: President, D. D. Thompson; vice-president, E. T. Fox; secretary, E. M. Johnson; treasurer, Charles Sturtevant; directors, E. R. Fox, Dan White, George Doll, Fay Hardy, E. M. Johnson, H. A. Randle, Tony Gatterman, Tom Weese, O. H. Davis, O. E. Smith.

SIOUX CITY, Ia.—A case of much interest to rural telephone patrons, involivng the rights of said patrons to dispose of their telephones when they sell their farms, has come up for trial in Justice Ferris' court. The suit is brought by E. P. Webster against one John Spalding, who claims to have purchased the telephone and the rights to the rural system with the purchase of the farm.

NACOGDOCHES, Tex.—The Fussell Telephone Company of Cushing was caused to appear before Judge Berger and show cause why an injunction should not be issued restraining that company from operating a long distance telephone line from Cushing into this city. The plaintiff in the case, the Texas Central Telephone Company, alleges that the competing line would cause confusion over its own lines if constructed.

MILWAUKEE, Wis.—John E. Reilly, receiver of the Independent Consolidated Telephone Company, will ask the court to confirm the sale of the concern to W. R. Little & Co., a St. Louis trust company, for $8,050. The bids of the St. Louis brokers were received after the auction, but, anticipating such a contingency, the trustee had received permission to make a private sale if a sum higher than that bid at the auction could be realized. It is thought the motion for a confirmation of the private sale will cause renewed bidding. The matter will be presented in Judge Halsey's court Saturday. December 23.

NEW YORK, N. Y.—The claim of the United States Independent Telephone Company that under charter rights which it has bought from the Mercantile Electric Company it has the right to lay telephone wires under the streets of Greater New York is now under investigation by Corporation Counsel Delaney of this city. It is announced that the United States Independent Telephone Company has acquired a majority of the stock of the old New York Independent Telephone Company, which in turn has been merged with the Mercantile Electric Company, the owner of the old franchise. This franchise the company claims gives it right to lay underground wires and cables for telephonic and telegraphic purposes and to build subways for such wires and cables.

COMBINATIONS

MEREDITH, N. Y.—The Meredith Telephone Company has sold its line to the Rose Telephone Company of Otsego county.

INDIANA, Pa.—The Indiana Telephone Company and the Farmers' Telephone Company's lines of this county have been united.

NORTH COLLINS, N. Y.—The North Collins Telephone Company has been purchased by the Inter-Ocean Telephone Company of Buffalo.

WADSWORTH, O.—The Wadsworth General Electric Company's telephone system at this place has been purchased by the Star Telephone Company at a cost of $10,000. The system will be entirely remodeled and will be merged with the large system controlled by the Star company.

ABINGDON, ILL.—The North Fulton Telephone Company has been merged with the Mutual Union Telephone Company of this place.

LE ROY, IA.—The Le Roy Telephone Company has absorbed the M. J. Loftie Telephone Company, which operates several lines in and about New Haven, Ia.

BONESTEEL, S. D.—The Nebraska Interstate Telephone Company and the Gregory Home Telephone Company have been merged and will make extensive improvements and extensions.

GRATZ, PA.—The Lykens telephone line, extending from Gratz to Good Spring, has been sold by the United Telephone and Telegraph Company to the Dauphin and Schuylkill Telephone Company.

ST. JAMES, MINN.—The St. James Telephone Company has purchased the local telephone system formerly owned by the Southwestern Minnesota Telephone Company for $9,000. The company will build a system of rural lines.

ALBANY, N. Y.—The Franklin County Telephone Company and the Racket Telephone Company have filed a certificate of merger with the Adirondack Telephone Company of Franklin county. Irving H. Griswold of Elyria, Ohio, is president.

PETERSBURG, Ill.—The Petersburg Telephone Company has purchased the Fancy Prairie rural telephone line, which formerly had its instruments rented from the Central Union Company, and the old instruments will be taken out and new ones installed.

CAMBRIDGE CITY, Ind.—The Citizens' Telephone Company of Cambridge City has bought the telephone lines of the Hagerstown Telephone Company, increasing its capacity for free service to its patrons. It owns and operates 1,500 telephones and will extend its lines into Henry and Randolph counties.

SUSSEX, N. B.—The Central Telephone Company of New Brunswick has absorbed the Richibucto-Rexton Telephone Company, which will be connected with the company's lines at Campbellton. Negotiations are in progress with a view to making connection with the lines along the St. Johns River.

NORTHVILLE, Mich.—J. B. Ware and R. B. McPherson, acting for the Peninsula Telephone Company, have purchased a large majority of the stock of the Northville Telephone Company from the local stockholders. This company has the only exchange in Northville and operates nearly 300 telephones, besides toll lines to Novi, Plymouth and Farmington.

CLAYTON, Mich.—The stockholders of the South Dover Telephone Company and the stockholders of the North Clayton Telephone Company are making arrangements to merge the interests of the two companies into a company to be called the Clayton Telephone Company. It is the intention to spend considerable money in improvements, which will include a new switchboard.

FRAZEYSBURG, O.—The Frazeysburg Independent Telephone Company has purchased all the property of the Farmers' and Merchants' Telephone Company in Muskingum county, including the Frazeysburg exchange and twenty-eight miles of farm lines. A toll line will be built connecting with the lines of the Zanesville Telephone and Telegraph Company and the United States Telephone Company. The system will be improved and additional farm lines will be constructed.

CAMBRIDGE CITY, Ind.—The Citizens' Telephone Company is now sole owner of the Hagerstown telephone plant, and the two exchanges are being reconstructed. The consolidation represents 1,600 telephones, extending over a territory nearly thirty miles in length. James A. Boyd and Charles A. Boyd are the owners of the system and have ample capital to make all improvements necessary to increase the capacity of the plant and equip it with the most modern apparatus, which it is their intention to do.

FORT WAYNE, Ind.—A proposition is said to be pending between the Home Telephone Company and the National Telephone Company whereby the former will take over the latter. The capital stock of each company is $250,000. The National owns a long line of toll lines with exchanges at Auburn and New Haven. It is proposed to merge the two companies under the Home charter. The Home company has under consideration a proposition to extend the time of its twenty-five year bonds to thirty years.

WASHINGTON, Pa.—The Greene County Telephone Company, by the purchase of the Carmichaels Telephone Company, will enter the Greene County field and begin active competition with the Bell and other interests. The general manager of the company is T. B. Lee, formerly connected with the Pittsburg and Allegheny Telephone Company. The Carmichaels Telephone Company had franchises on the principal streets of Waynesburg and lines will be built into the Greene County capital at once. By working agreements with other lines the new concern will be able to reach Uniontown, Wheeling, Pittsburg, Allegheny, Johnstown and as far east as Harrisburg, Philadelphia and Baltimore.. J. G. Splane, president of the Pittsburg and Allegheny Telephone Company, R. C. Hall and H. B. Beatty of Pittsburg, are said to be interested in the new concern.

COLUMBUS, O.—By the purchase of $30,000 of the stock of the Gallipolis Telephone Company a syndicate composed of Toledo and Columbus men has come into control of that property and steps will be taken at once to greatly improve and extend the exchange. At present the Gallipolis exchange has about 500 subscribers and is

modern and up to date, being one of the best Independent plants in southern Ohio. The parties who have purchased the controlling interest are Cyrus Huling of Columbus, Dwight Sapp and Frank Beam of Mt. Vernon, W. W. Morrison and J. E. Gardner of Toledo and E. N. Coen of Vermillion. The new owners will build exchanges in Pomeroy and Middleport and a long distance line will be constructed to Athens. The new officers of the company will be selected at the annual meeting, which will be held some time next month.

MISCELLANEOUS

ENSLEY, Ala.—A telephone exchange is being established in Ensley.

HOQUIAM, Wash.—A new telephone exchange is being installed at this place.

PETERSBURG, Ind.—The local telephone exchange was recently destroyed by fire.

PARKERSBURG, Ia.—The telephone exchange at this place has been destroyed by fire.

AUGUSTA, Mich.—The Citizens' Telephone Company has opened an exchange at this place.

CONCORD, Ill.—The Home Telephone Company is rebuilding its line from Concord to Chapin.

KERENS, TEX.—The Independent Telephone Company at this place is improving its system.

PROPHETSTOWN, Ill.—The Prophetstown Mutual Telephone Company will be incorporated.

EVERETT, Wash.—The Farmers' Mutual Telephone Company has opened its exchange in this city.

NEW BEDFORD, O.—Residents of New Bedford are organizing an Independent telephone company.

MACOMB, Ill.—An Independent telephone line has been completed from Macomb to Monmouth.

TORONTO, Can.—It is proposed to construct telephone lines along the route of the Georgian Bay Canal.

CHERRYVALE, Kans.—The Cherryvale Telephone Company recently sustained a heavy loss by fire.

PETERSBURG, Ind.—The Pike County Telephone Company recently sustained a $2,000 loss by fire.

ROSEAU, Minn.—Fox & Jewett have completed a long distance telephone line from Roseau to Warroad.

CLAYSVILLE, Pa.—The Claysville Telephone Company is establishing an exchange at West Alexander.

ODELL, O.—The Odell and Sugartree Telephone Company has completed a line from Odell to Cambridge.

WASHINGTON, Ind.—The telephone system at this place recently sustained loss in telephones and cable by fire.

HORSE CAVE, Ky.—The local telephone exchange, owned by George Tucker, was recently damaged by fire.

BROOTEN, Minn.—The Brooten Telephone Company has completed its exchange and has begun operations.

MCCONNELL, Ill.—The McConnell Telephone Company is constantly adding to the number of its subscribers.

NORWICH, N. D.—The farmers of this vicinity are considering a proposition to establish a rural telephone service.

GLACE BAY, N. S.—The Eastern Telephone Company is making a number of improvements on its lines in Glace Bay.

ORTONVILLE, Minn.—The Minnesota Central Telephone Company has installed a new metallic system in Ortonville.

EAST FAIRFIELD, Vt.—The Franklin County Telephone Company has opened an exchange at this place with 75 subscribers.

ROANOKE, Va.—The Virginia-Tennessee Telephone Company has purchased a site and will erect a new telephone exchange.

WATKINS, Ia.—The North St. Clair Township Telephone Company has begun the construction of a new telephone line.

UTICA, Ky.—A new telephone exchange is being installed in this place, which will begin business with about fifty subscribers.

HADLEY, Mass.—The Citizens' Telephone Company of Williamsburg has asked permission to establish its service in Hadley

OSKALOOSA, Ia.—A rural telephone company is being organized in the vicinity of Oskaloosa by Charles Whitmore and others.

RICHMOND, Ind.—The Richmond Home Telephone Company has just issued a new directory which shows a list of 2,300 subscribers.

SAVANNAH, Ga.—The Georgia Telephone Company announces that its subscription list has recently been increased to 3,275 subscribers.

MORGAN'S GAP, Ky.—A telephone exchange has been established at this place, with seventy-five subscribers, and more are to be added.

CHARLOTTETOWN, P. E. I.—The Telephone Company of Prince Edward Island is completing the installation of its system in Summerside.

DOLGEVILLE, N. Y.—The Interstate Telephone Company has begun the work of making extensive improvements in its system in this village.

MARION, Ind.—O. L. Barger, who has secured a franchise in the interest of an Independent telephone company in this city, states that the parties back of the enterprise are willing to spend about $350,000 in establishing a local telephone system, including toll lines and buildings.

SLOAN, Ia.—An effort is being made to organize a mutual telephone company with main office in Sloan, and rural lines radiating in every direction.

RUSSELLVILLE, Ark.—The Russellville Telephone Company, of which J. C. Bonds is manager, has been making various improvements on its plant.

HARDWICK, MINN.—R. A. Heck and others of Hardwick, contemplate forming a local company for the purpose of installing a telephone exchange.

DAYTON, O.—The Montgomery County Telephone Company is making an effort to develop its field in this county, and a number of new exchanges have been established.

BAIRD, Tex.—The Home Telephone Company of this place has increased the number of its subscribers from eighty-seven to 250 the past year, and its list is still increasing.

TAMPA, Fla.—The Peninsular Telephone Company's exchange at Arcadia recently suffered a loss by fire, which practically destroyed the entire business portion of the city.

GEORGETOWN, S. C.—The Home Telephone Company, incorporated with a capital stock of $15,000 to construct and operate a telephone system, has completed its organization.

GILLHAM, Ark.—The Rural Telephone Company has installed an exchange at this place. Among those interested in the company are H. Shufeldt, G. W. Ross, and E. L. Hogle.

WALLA WALLA, Wash.—A meeting of business men and citizens, by a vote of 27 to 5, ratified the action of the council granting a franchise to the Automatic Telephone Company.

PEORIA, Ill.—The Farmers' Mutual Telephone Company is building a line from El Paso to this city where it will connect with the exchange of the Interstate Telephone Company.

LOWELL, IND.—The exchange of the Lowell Telephone Company has been destroyed by fire. The exchange will be rebuilt at once and some new equipment will be added.

YUKON, Okla.—The Canadian Valley Farmers' Telephone Company and the Yukon and Richland Telephone Company of Yukon are making rapid gains in the number of subscribers.

PARSONS, Kan.—The Home Telephone Company has about completed a complete overhauling of its system, having spent about $20,000 in improvements and in increasing its capacity.

JEFFERSON, O.—The inability of the Jefferson and Warren Telephone Company and the New Lyme Telephone Company to come to terms may result in another company being formed.

ROYALOAK, Mich.—An Independent telephone line is being installed at this place which will be extended to Birmingham and vicinity should sufficient patronage be secured to warrant it.

DWIGHT, Ill.—A new telephone plant has been installed at Dwight with 300 telephones in the town and between 300 and 400 on the different farmer lines at an estimated cost of $26,000.

HECTOR, Ark.—The Hector and Coglesville Telephone Company of this place is constructing a toll line from Hector to Russellville, where it will connect with the Russellville Telephone Company.

REPUBLIC, Mo.—A movement is on foot to organize a mutual telephone company at this place. Some of the leading merchants and farmers of the surrounding country are behind the enterprise.

APPLETON, Wis.—Connections between Appleton and Green Bay have been made by the lines of the Fox River Valley Telephone Company. Exchanges will be installed at all the intervening towns.

MAYFIELD, Ky.—The promoters of the Independent Telephone Company have secured 100 subscribers for the new telephone exchange, which will at once secure the establishment of the same.

YUKON, Okla.—The Yukon and Richland Telephone Company has installed a new switchboard at Rural Center and a toll line is also being built from Rural Center to Yukon, El Reno and Richland.

TORONTO, Ont.—Mayor Urquhart of Toronto will ask parliament to sanction a measure authorizing municipalities to compel telephone companies to pay a percentage of their receipts for the use of highways.

MINOCAQUA, Wis.—The town of Minocqua is beginning to feel the need of telephone service with the surrounding towns and the question of installing such service is being agitated by the Minocqua Times.

RAVENNA, O.—The Portage County Telephone Company has more than 2,000 telephones in service. The company operates exchanges at Ravenna, Kent, Mantua, Garrettsville, Windham and Hiram.

PEEKSKILL, N. Y.—The State Line Telephone Company has opened up its new exchange in this city with about 250 telephones in use and this number will be increased as rapidly as they can be installed.

MORRIS, Minn.—The Tri-State Telephone Company, which recently purchased the exchange at this place, has commenced the reconstruction of the plant. A large amount of cable will be installed.

SEWARD, Okla.—A number of farmers of Seward and Iron Mound townships recently held a meeting in Seward to consider the matter of a rural telephone system. Among those ineerested are E. Y. Freeman and C. P. James. Another meeting will be held in

the near future for the purpose of effecting a permanent organization.

RARDEN, O.—D. T. Blackburn and associates of Rarden have begun the construction of a telephone line from Rarden to Lucasville, at which point connection will be made with the Portsmouth exchange.

SPRINGTOWN, Pa.—The Franklin Telephone and Telegraph Company, recently incorporated, has about completed the construction of a telephone line from Quakertown to Riegelsville, with Springtown as its center.

UNIONVILLE, Mo.—The Farmers' Mutual Telephone System is extending its lines to connect with Monterey, Bloomfield, Lancaster and other points, and the building of additional new lines is under consideration.

PHILADELPHIA, Pa.—Negotiations are said to be pending for the control of the Eastern Telephone Company, which operates systems in Camden and Gloucester, N. J., by the Keystone Telephone Company of this city.

VAN WYCK, Idaho.—The Long Valley Mutual Telephone Company has completed a telephone line between Van Wyck and Laredo, which places both cities in communication with Boise over the Independent system.

SALT LAKE CITY, Utah.—The Independent Telephone Company has completed its line to Preston. The company has ten wires to Preston and intermediate points and will soon have exchanges in all the towns north of Logan.

MILAN, Ind.—The directors of the Milan Telephone Company at a recent meeting appointed a committee to purchase all needed material, and if the weather will permit the system will be in working order within a short time.

MINNEAPOLIS, Minn.—The council of this city proposes a campaign against overhead wires of all kinds. An ordinance is before the council creating an inspector of wires with power to order them down if they become dangerous.

KEWANEE, Ill.—The Kewanee Home Telephone Company has just issued a new directory showing a list of 2,000 subscribers, of whom about 250 are country line patrons. The list shows an increase of 200 over the previous one.

BRANTFORD, Ont.—At a recent meeting of the telephone committee it was decided to recommend to the council that a franchise be granted to the Canadian Telephone Machine Company, provided suitable agreement can be drawn up.

HAMILTON, O.—The Hamilton Home Telephone Company has had an unusually prosperous business the past year, having increased the number of its subscribers over 1,000. W. Gilbert Thompson is manager of the company.

PRESCOTT, Ark.—The country surrounding Prescott is being covered by rural telephone lines, by the companies operating in this section—namely: the Southwest Arkansas Telephone Company and the Nevada County Telephone Company.

LA CROSSE, Wis.—C. D. Enochs is interested in the promotion of an enterprise for the manufacture of appliances used to anchor telephone and telegraph poles in the ground. The papers required have been filed with the register of deeds.

CHIHUAHUA, Mex.—The Chihuahua Telephone Company is installing an improved telephone system with a capacity of about 400. The company will also build a line to Santa Rosalia. A. C. Nash is vice-president and manager of the company.

SAUK CENTER, Minn.—The Pleasant Valley Telephone Company, recently organized, has begun the construction of a telephone line extending south from this place. Its object is to connect the rich farming district in Pleasant Valley with Sauk Center.

MCKINNEY, Tex.—The McKinney Telephone Company has just completed the installation of an up to date telephone system, which places the local exchange second to none in the state in modern equipment. The company has 550 subscribers in the city.

GRAND RAPIDS, Mich.—The Citizens' Telephone Company installed 136 new telephones during the month of November, with 100 names on the waiting list. The company now has 7,007 telephones in use, and the long distance business shows a great gain.

SWEDESBORO, N. J.—After eleven months of actual business the People's Rural Telephone Company, with headquarters at this place, has four exchanges in operation with 625 telephones in service. W. K. Sloan is general superintendent of the company.

WASHINGTON, D. C.—Mr. Gauss, chief clerk of the Navy Department, is credited with the statement that negotiations are pending for the establishment of an interdepartmental system of telephones, which shall be entirely independent of the city exchanges.

MANISTEE, Mich.—The Northern Michigan Telephone Company will, on December 1, sell all the rights, franchises, lines, poles, telephones, material, tools and implements belonging to the company, or so much thereof as will be necessary to pay off the indebtedness of the company.

LOWELL, O.—The Lowell Farmers' Independent Telephone Company, which was recently incorporated with a capital stock of $10,000, is getting ready to handle a large business in the vicinity of Lowell. The company is engaged in extending its lines to Whipple and Germantown.

ELBERFELD, Ger.—Hans Starcke, of Elberfeld, has obtained a patent for a device by which a phonograph is connected with the telephone. Should there be no one present when the telephone call is made the words are recorded upon the phonograph and can be repeated at any time.

COLUMBIA, Mo.—The Columbia Telephone Company has a list of 1,100 subscribers, 800 in the town and three hundred outside. It has forty miles of exclusive toll line, reaching to Jefferson City and to Hartsburg, with copper metallic circuit, and one hundred and fifty miles of farmers' lines.

CANNELTON, Ind.—The Independent telephone corporation which obtained a municipal franchise under the name of the Cannelton, Branchville and Eckerty Telephone Company, has begun the erection of a plant and will soon establish an exchange in this city for local and county service.

WHEELING, W. Va.—The National Telephone Company has made application to the United States government for the right to construct a submarine cable across the Ohio river from Benwood to Bellaire. Work on the construction of the cable will begin as soon as the application is granted.

JOLLY, O.—The Washington and Monroe Telephone Company, which has just been incorporated, will have Jolly for its headquarters. The company is authorized to construct and operate telephone lines from New Matamoras to Woodsfield and branches in Washington and Monroe counties.

JAMESTOWN, N. Y.—The Home Telephone Company is installing a new switchboard which will increase its capacity 50 per cent. This has been made necessary by reason of the rapid growth of the business during the past few months. New orders are coming in at the rate of more than 100 per month.

HASTINGS, Neb.—The Glenwood Telephone Company, which has over 1,800 subscribers, has made connection with the Automatic Telephone Company. The Glenwood company operates exchanges in Ayr, Bladen, Blue Hill, Roseland, Holstein, Cowles, Juniata, Rosemont, Mt. Clair, and Guide Rock.

LEXINGTON, Ky.—The Board of Directors of the Fayette Home Telephone Company have authorized George B. Shanklin, president, and General Manager Taylor to investigate and report at the next meeting the cost of increasing the facilities of the company in the southeastern section of the city.

ROCKWOOD, Tenn.—A telephone war is being waged in Rockwood, brought about by proposed increase of rates by the Cumberland Telephone Company. Business men are said to be in favor of a local mutual telephone system in case the company's plans are carried out, and are ready to finance such a proposition.

ATLANTIC CITY, N. J.—The National Grange, Patrons of Husbandry, at a recent meeting in this city passed a resolution favoring a proposition to have the farmers organize independent telephone companies in their various localities, to secure more reasonable rates and better service through competition.

MILWAUKEE, Wis.—The committee on judiciary, which has in hand the granting of a franchise for a telephone system, will decide whether a flat rate or measured system shall be installed before granting said franchise. Arguments will be heard by representatives of all companies upon the advantages of each system.

SAN FRANCISCO, Cal.—The Standard Electrical Construction Company of this city has contracted to install a complete central energy telephone system for the Del Monte Hotel at Monterey, Cal., and to rewire the main hotel building for about 5,000 lights. About 400 telephones will be installed about the hotel and grounds.

ALLIANCE, O.—Fire Chief W. S. Aungst and Captain Arthur Aungst, of the fire department of this city, have been granted a patent on a new system of electric signals to be used in connection with established telephone systems. By this system fire alarms can be sent in with an ordinary telephone in a simple and rapid manner.

MONTREAL, QUE.—The Merchants' Telephone Company, which has been doing business in Montreal since 1895, has 1,546 telephones in service. The officers of the company are as follows: President, A. G. N. Culbertson; vice-president, A. Jones; secretary-treasurer, J. Moisan; directors, A. S. Delisle, A. S. Hamelin.

MONTREAL, Que.—There are a larger number of telephone companies in the province of Quebec than in any other province of the Dominion. A list recently compiled for the House of Commons telephone committee showed that there were twenty-eight separate and distinct telephone companies carrying on business in Quebec, exclusive of the Bell.

PORTLAND, Oreg.—As the result of a remarkable series of tests on the O. R. & N., it is announced that General Manager J. P. O'Brien has been recommended to install telegraphones on the system. An experimental telephone service has been established on the circuit between Portland and the Dalles, and experiments have shown its practicability.

HUNTSVILLE, Ala.—The Inter County Telephone Company has about completed its new system, covering the southeastern portion of Morgan county and connecting the system with Huntsville. The company was incorporated with a capital stock of $20,000 and its officers are as follows: President, C. E. Hogeboom; vice-president, Gus May; secretary, C. D. Hogeboom.

CLEVELAND, O.—On November 6 the Cuyahoga Telephone Company had 19,494 telephones and is gaining at the rate of 500 a

month. The company expects to have 20,000 in operation by January 1. This company is said to have more telephones in operation than any other Independent company in the United States, with the possible exception of Los Angeles, Cal.

WINNIPEG, Man.—The provincial government at its next session will introduce a bill providing for government owned systems of rural telephones, to be constructed and operated by the aid of municipalities. The scheme outlined embraces a trunk line available for all municipalities, which the government will construct and the municipalities must build all branches desired.

LEWISTON, Mont.—The Lewiston-Billings Mutual Telephone Company, which recently opened its exchange at this place, has announced a rate of $1.50 per month, being a cut of $1 from the rate charged by the Lewiston Telephone Company. A telephone war is anticipated, as the latter company has issued a circular stating it stands ready to meet all reductions, even to a free service.

MILTON, Ore.—The Hudson Bay Telephone Company is improving its line out of this place by the erection of poles, the line heretofore having been barb wire, constructed along the fences. A new metallic circuit will be installed. The officers of the company are: President, Frank Steen; secretary, W. S. Goodman; treasurer, Dana Saunders; directors, C. E. Simonds, L. D. Kirk, Dan Kinney.

FAIRBURY, Nebr.—The Fairbury Telephone Company is rebuilding its lines. A short time ago the capital stock of the company was increased to provide $15,000, the approximate cost of the projected improvements. The Fairbury company has practically won its fight against the Bell company in this place, and will be able, with its system rebuilt, to make good its pledges to the people and give good service at low rates.

CLEVELAND, O.—President Dickson of the United States Telephone Company believes that he will be able to very greatly reduce the operating expenses of the company for the year 1906, and at the same time maintain the property in as good, if not better condition than it is now being maintained and operated. The company has made substantial increase in its gross earnings the past year, but operating has also increased to a greater extent than is thought necessary.

DES MOINES, Ia.—The Mutual Terminal Telephone Company, which is composed of the Hawkeye Telephone Company, the Jasper County Telephone Company, the Knoxville Electric Company, and the Southern Iowa Telephone Company, is installing a new switchboard, which involves the expenditure of about $10,000. Nearly all of the farm lines over the state are managed by these five companies. The companies have an agreement whereby the lines of each company can be used in long distance service.

ROYALOAK, Mich.—Albert Haynes and associates of Royaloak and Birmingham are making arrangements to operate telephone exchanges at Birmingham and Royaloak. They will operate under the name of the Detroit Suburban Telephone Company, corporation papers for which are being prepared. The company will take over all the property of the Michigan State company in the two towns. About eighty telephones are already in service in Birmingham and about seventy-five contracts have been secured in Royaloak and vicinity.

FT. WAYNE, Ind.—Mr. George W. Beers, president of the Queen City Telephone Company of Cincinnati, has recently been in conference with the members of said company. Application has been made for a new charter, which will perfect the organization of the company, and it will ask for a new franchise from the city administration immediately after the installation of the new officers January 1. While the decision recently handed down by the Supreme Court was adverse to the telephone company, it has cleared up many uncertain questions regarding the right of corporations to use the city streets and it is now very probable that a franchise can be granted without risk of error.

INDIANAPOLIS, Ind.—The Indianapolis Telephone Company will, as soon as the proper papers are prepared, ask the board of works of the city for modifications and alterations in the contract now existing in order that the company may raise its rates. The company will also ask that forty years be added to the life of the franchise under which it is now operating. These requests are brought about by the greatly increased expense resulting from the unforeseen proportions reached by the company's business, and a plan to float a bond issue of $50,000 to meet the expense of extensive improvements. When the company was organized provision was made for 3,000 subscribers and at present the list numbers about 10,000.

NEW YORK, N. Y.—A circular issued by the Great Eastern Telephone Company states that contracts for service to the amount of more than $1,500,000 have already been signed in a canvass of five weeks, also that there will be 200,000 subscribers before the preliminary canvass is complete. The officers of the company are as follows: President, D. A. Reynolds, who is also president of the Coast Line Telephone Company, vice-president and manager of the State Line Telephone Company and manager of the Atlantic Telephone Company; vice-preisdent, J. Van Vechten Olcott; secretary, Eugene H. Brock; treasurer, W. Myron Reynolds; directors, W. C. Adams, George H. Bidwell, Stephen M. Conger, George C. Edwards, George V. Hagerty, Gustav Lembeck, J. Van Vechten Olcott J. F. O. Meyer, Edwin M. Millard, David B. Sickels, D. A. Reynolds, W. Myron Reynolds, W. H. Stayton, D. J. Tingley, Edward G. Ward.

THE RURAL TELEPHONE.

Neighbors, not so far from here,
Put in telephones last year,
Farmers built a rural line—
Instruments all "talked up fine";
All you had to do was ring—
Every bell went ting-a-ling!
One for central, two for Boggs,
Short and long call for old Scroggs.

Every neighbor had his call,
Twist the crank and that was all.
Mighty nice when work was through
To gossip for an hour or two
With your neighbors one by one.
Mighty nice—but lots of fun
When you heard some other two
Telling what was not for you.

Every time the signal rang,
To the 'phone each farmer sprang,
Slyly grinned, and softly took
Each receiver from its hook.
Other people's secrets dear
Poured into his large red ear;
How he slapped his legs—"I swan,
Telephoning is lots of fun."

Somehow in a year or two
Troubles dark began to brew;
Farmer Jones got fighting hot,
Heard Scroggs calling him a sot.
Farmer Scroggs seemed angry, too,
Heard Smith telling what he knew.
Smith heard Abel telling lies.
Paid him off with two black eyes.

Abel heard young Isaac Boggs
Underbid him on his hogs;
Boggs o'erheard a sneaking churl
Making love to his best girl.
Women, too, were in the muss.
Raised a most tremendous fuss.
Every one from Scroggs to Jones
In glass houses throwing stones.

Now the line has silent grown,
Wires rusted, poles o'erthrown,
Twenty friends are deadly foes,
Each one full of grief and woes.
Each too mad to speak a word,
'Cause of things he'd overheard.

—*Cambridge Republican-Press.*

COULDN'T UNDERSTAND IT.

It is certainly strange that Miss Central Hello
Should throw up the good job that we give her and go
At the very first chance that she gets to St. Joe
And a preacher
That a girl should reject, when the chances she weighed,
A fine berth, where magnificent wages are paid,
Should abandon the easy and beautiful trade
That we teach her.

When she has a nice stool she can sit on all day
And a buzz at her ear that is clamped there to stay,
Well, you can't call it work, it is absolute play,
That just fits it.
When she's used to headaches, the flash of the light,
And the pain in the spine and the working at night,
When she's on to her job (which the drawbacks are slight),
Why, she quits it.

It may be her poor taste, but it seems awful cheek,
A reflection on us a mere husband to seek,
When she's drawing her four to eight dollars per week.
(Some command it.)
When so many girls work at a salary scant,
When a scrubber doesn't earn so much more, you will grant
That it is very strange. I admit that I can't
Understand it.

—*Chicago Examiner.*

IN THE RURAL LINE DISTRICTS

Illustrated by O. H. Brandenburg

The telephone girl's sweet "Busy now" will soon be heard in Burlington.—*Burlington Jottings in Denver (Colo.) Post.*

"Lineman Ed" was out this way the first of the week fixing up the long distance telephone line.—*Kimball (S. D.) Index.*

Poles are being erected for the telephone which is to be built through this place.—*Dale Happenings in Reading (Pa.) Eagle.*

It is rumored the tapping of telephone lines is nothing of unusual to hear of in the vicinity of Boone.—*Cedar Rapids (Ia.) Gazette.*

Still, they will never be able to put a girlless exchange into any office where the telephone girl is real pretty.—*St. Louis (Mo.) World.*

That the obliging telephone girls in Bellefonte ought soon to get married or be able to start a jewelry store. They get so many rings.—*Bellefont (Pa.) Gazette.*

Walter Hobbs is doing a land office business at the McKinnon Corners. Walter also is the boss hello, as well as a good fellow.—*Union and Truax Items in Eau Claire (Wis.) Leader.*

The telephone company "cut in" a new switchboard yesterday. The new board works just the reverse of the old one and as a consequence "Central" is having her hands full.—*Peekskill (N. Y.) News.*

Mrs. Chambliss, who purchased the Logan homestead, has the Farmers' line, Central telephone office now. The wires are all in and lines in working order.—*Blue Grass Items in Davenport (Iowa) Times.*

The oyster train passed through here yesterday en route to Lexington, but left several buckets of oysters in our city. The news was telephoned to all interested parties.—*Olive Hill Items in Ashland (Ky.) Independent.*

A new telephone company has been organized at the Dale. It is known as the "Jerk Water Telephone Co." Its officers are Jesse Spitzer president, Jas. Paul secretary and treasurer, John Scroff attorney and Ward Drake business manager and dispatcher of news. Ward says that when it gets connection with the Associated Press news will be dispatched at all hours of the night or day.—*Huntingdale Correspondent in Clinton (Mo.) Reporter.*

There are a few parties on our telephone lines who are occasionally so interfering with the services, by adding extra rings, cat calling, whistling, etc., that they will be severely dealt with by fine and imprisonment when caught, and they will be caught just as sure as it is continued. The telephone company also will pay a liberal reward for evidence convicting any one who breaks insulators and otherwise destroys their property. They propose to see that these matters cease.—*Alma (Kas.) Enterprise.*

The Star Telephone Company met last night to consider some important items, prominent among which was connection with the Worden company by commercial line. This connection can not be made too soon to suit Worden. It is interesting to note that a line of poles is being set leading directly west of Worden. Now with this start the country west to Globe and later to Overbrook, will be tied to us by wire. Worden is small, but oh, my! watch our telephone wires extend. Several new phones are being placed this week.—*Worden Items in Lawrence (Kas.) World.*

A new telephone is being put in on the road between Otter Creek and Koshkonong.—*Koshkonong Correspondent in Janesville (Wis.) Gazette.*

On Wednesday afternoon there was a strike of the linemen on the local telephone system. They have been in the habit of reporting for work two hours late, and when notified by the superintendent that their pay would be reduced if matters continued that way, the matter was laid before the union and a strike was ordered. Jimmy Keenan and "Stub" Washburn went out while "Punk" Gledhill remained. Later the superintendent secured

"Dutch" Sucher and the three men are now hustling the work along as fast as possible. There are about 180 telephones on the system, thirty of which have been put in this month, and there are contracts ahead for more.—*Castile Correspondent in Warsaw (N. Y.) Times.*

The last telephone on the Levant line was placed Friday afternoon and to say the subscribers were elated over them is placing it mildly. All were anxious to ask a neighbor a question and very often, and the telephone bells kept up a merry jingle until a late hour at night.—*West Levant Notes in Bangor (Maine) Commercial.*

The committees who were appointed at a meeting of several of the local business men last week to solicit stocks and phones for lines which are to be built from this place, extending in different directions have met with good success. The line to be extended from the Wm. Root farm to the John Poncin farm has been solicited and all farmers on the route have taken stock.—*Morgan Messenger in Redwood Falls (Minn.) Gazette.*

Seeing in a recent issue of The News where W. M. Redwine of Comanche, Tex., desired information on how to make a home telephone, will send my way. For boxes, take lumber 6 inches wide, 14 or 15 long; make boxes tight, opened at both ends. For drum, use rawhide; take piece hide about 6 inches wide, 15 inches long; soak in strong solution of ashes and water until hair will slip, then cut a square of the hide to fit one end of each box. Nail on box while wet, driving small nails one inch apart. Stretch hide while nailing, but not tight. Set boxes in shade until hide is dry, then punch a small hole the size of a slate pencil in center of hide, then get a copper cent for each box and punch two small holes, one on each side, as near center of copper as possible. Use No. 19 smooth, ungalvanized wire. If No. 19 wire is not available, use copper wire. Copper wire is best and will last longer, but the other wire is all right and will last until you are tired of the telephone.

Directions for putting it up: Bore a hole an inch or inch and one-half through wall of house in the direction the telephone is to run. Take one end of wire, placing it through the hole from outside. Place the open end of the box to the wall, run the wire through box, drum, and one hole of copper, bring end of wire back through other hole of copper and wrap around main wire once or twice. When wire is stretched, see that copper fits close to drum. Hang the wire with cloth strings, being careful the wire touches nothing but the string loops. To prevent wire from touching wall, use a string, pull in direction telephone is to go and tie to nail in wall.

I have had quite a lot of experience with the home telephone and this is the most successful way I have found yet. If Mr. Redwine does not understand it thoroughly, write to me and I will give you full instructions, which, for lack of space, I cannot here. I forgot to say to cut a piece of board size of end of box, bore a hole in center, nail over drum, then your telephone is complete. Success to our editor and paper.—G. F. Bell, Von Ormy, Bexar Co., Tex., R. F. D. No. 1, Box 13.—*Special Correspondent in Galveston (Texas) News.*